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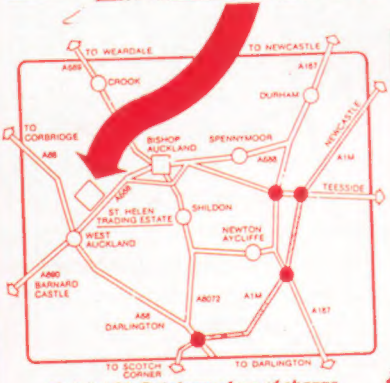
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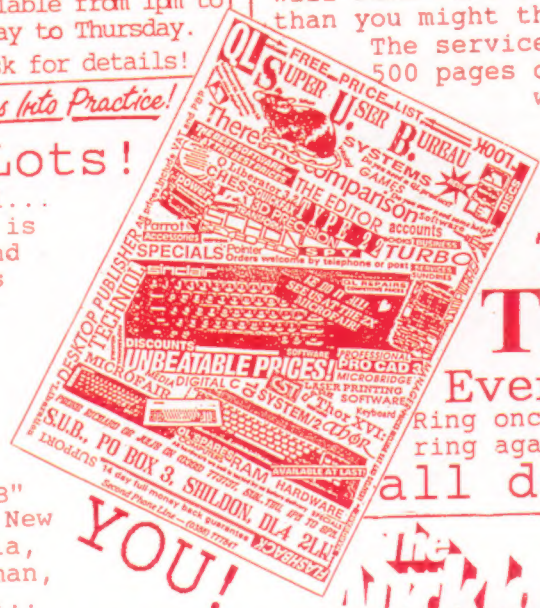
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NEXT MONTH

Here is the bulletin news Ron Massey sizes up several comms packages and finds ways of using them.

SuperBasic
Mike Lloyd begins a two-part series on super-tidy Basic programming.

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QL

QL in Oz
is still
jumping

QL Australia is an independent QL user group based in Sydney. The group is in contact with a number of local groups in all the Australian states, as well as groups in other areas of the South-east Pacific area. Members from all over that part of the world are welcome and can obtain more information from QL Australia, PO Box 729, Parramatta 2150, New South Wales, Australia.

The group information sheet mentions monthly meetings, an expanding software library and help with problems. QL Australia charges \$15 Australian per year with a \$5 joining fee.

DTP laser is at your service

Taylor Made Systems Ltd, which offers a laser printing service from *Front Page*, *Desktop Publisher*, *Page Designer 2* and *Quill* files, has moved its office and expanded its range of services. For more details and a scale of charges for laser printing, contact Taylor Made Systems at 27 Rydens Grove, Hersham, Surrey KT12 5RU. Tel: 0932 228721.

S C E N E

Any rooms in the Ark?

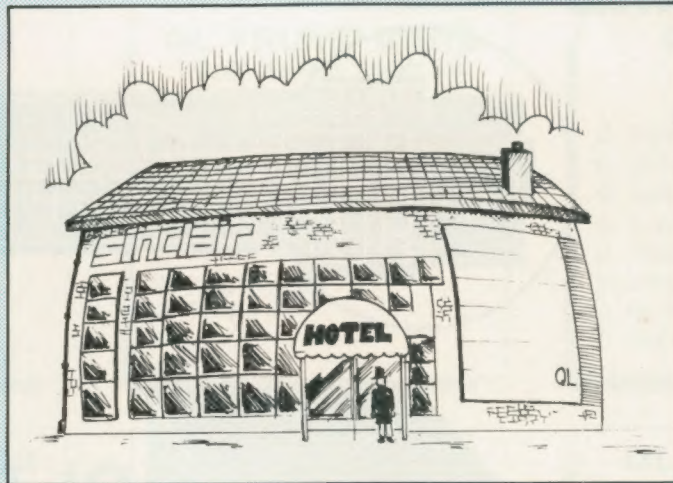
Ark Distribution is releasing an extensive *Hotel Manager* program for the QL and Thor, aimed at small- to medium-sized hotels and guest houses. Developed originally for a direct commission from the hotel trade, *Hotel Manager*

can handle accommodation enquiries and bookings from individuals, guest groups, agent lists and tour operators. The print facilities incorporated can generate addresses, registration forms, deposit and final invoices and receipts,

and auto-merged pre-written Quill letters and forms.

Ark has made ease of use a priority at every stage, with a single-keypress menu structure. The program is basically a six-file relational database manager based on Multi-File Archivist, which uses the Psion Archive run-time module to gain full Archive compatibility in screens, databases and export files. All the advanced Multi-File Archivist features are also available, including the ability for users to add their own Psion ArchDev extensions if they wish.

Hotel Manager will run on expanded QLs and Thors and can be ordered direct from Ark at Corve Farmhouse, Chale Green, Ventnor, Isle of Wight PO38 2LA. Tel: 0983 79496.



Take a note of the QL Notebook

ILD Datasystems is a new company producing software for the QL. Its first product, *Notebook*, is a notes editor and alarm facility. Resident in RAM, it is activated by pressing ALT and SHIFT together. The program then clears and stores the current screen and displays a pop-up menu. The user then selects the function required.

On exit, *Notebook* restores the screen at the point at which it was accessed, so that the user can continue with the previous task without a break.

Notebook is expandable and information is given in the manual to assist the user in writing further

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For further information contact ILD Datasystems at 13 Lon Ysgubor, Rhiwbina, Cardiff CF4 6SF.

Simon Goodwin has pointed out some errors in last month's DIY Toolkit, for which we share the blame:

In the first piece of code, for STS. L read TST. L.

In the last piece of code on page 11, for '4 = DIFFERENCE' read '4 + DIFFERENCE'.

In Table 1, on page 12, for 'maths stalk' read 'maths stack'; for '(3 = difference(x,x))' read '(3 + difference(x,x))'. In the last line, for 'computer' read 'computed'.

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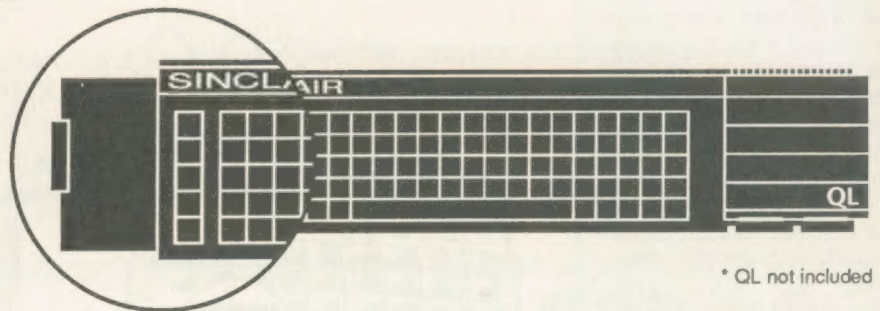


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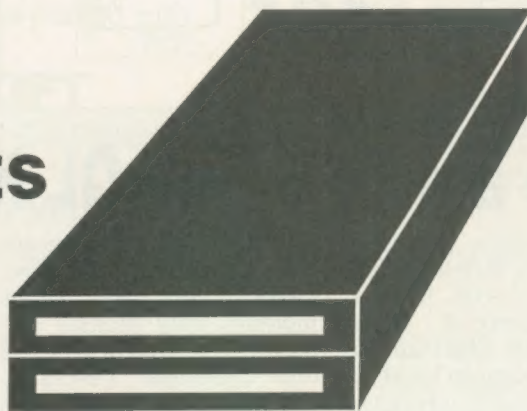
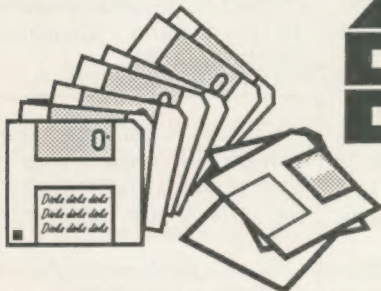
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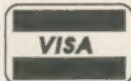
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with the answer, or just sound off about something which bothers you, write to: Open Channel, Sinclair QL World, Greencoat House, Francis Street, London SW1P 1DG.

Open channel

In an attempt to get to grips with the Qdos operating system I decided to write a short device driver. Since I had not realised that "call FS" stopped screen output, I was having difficulties following long listings. To that end I decided to write a Unix-type MOVE facility which displays a screen full of data at a time.

After suffering the usual crop of errors, mainly due to misunderstanding the various manuals, I found one which I could not solve. It involved "opening" an output screen from within the MOVE device OPEN routine. Somehow the

screen channel ID was lost by the system. Since all the code functioned when tested through a monitor, I decided that the ROM must be at fault. Tracing through the Qdos operations I discovered that the MOVE open was over-writing the screen channel table, resulting in the loss of a channel.

There seems to be no way of opening a channel inside the OPEN routine of the device without it being destroyed later. I hate to think what happens if you close one.

After a quick change of plan I altered the program to open the output channel at the device linkage stage.

Unfortunately, this means that only one MOVE type device can exist at any time. That is not too much of a disadvantage, since the screen can be disabled anyway. Does anyone want an obsolete device driver?

Also, can anyone help me discover what the function and returns of a "test for pending input" should be?

Nick Ward,
Seale Cottage,
Worth Matravers,
Swanage,
Dorset BH19 3LQ.

line 1830 and write line "1785 "end def wo".

The second problem at line 2030, which gives an expression error, is mysterious to me. It is a normal do-loop: "for k = 12 to 42 step 15". This line is closed correctly in line 2060, so it should work like any "for — end for — loop". If you write another "def proc k" or a "Def FN k" there is certainly an error message.

I tried such a procedure, and it came "IN ZEILE 2030 UNGUELTIGE BEZEICHUNG", the German error message. The easiest thing to bypass this is to make the variable "k" a local variable and to write a line "2005 loc k" or leave the merged by-program or toolkit or so that has a "proc k" inside. To change all references to "kk" in lines 2030 to 2060 to "k" would be another solution.

It would interest me to know whether these errors happened to people who typed the program from The Progs, or to people who bought an original copy from Microdrive Exchange.

In typing long listings, many mistakes can happen.

There is one thing I found which would make it even more foolproof. This is to change the line 1690 to "1690 IF b\$ <> "1" and b\$ <> "2" and b\$ <> "3" then go to line 1680".

This makes sure that, when the computer asks "which row?" and you type a letter instead of a number, or press enter without entering anything, the program will not stop for this mistake.

Heimo Geske,
Finland.

Spot check

I have received your letter about a reader who got error messages in *Dual Dominoes*. The first one you mentioned, in line 1830, which gives 'Not Found', works correctly on my QL. I tried to find what could have happened. This line is 'End Define,' that is, "end define wo"; the line before it is also "End Define", that is, "end define erg" and is the end of a procedure.

I could imagine that people who typed-in the program might think that there is something wrong in having two lines of "End Define" and so omitted one, or put an "end def" before the start of the "def prog erg". Also it could be that on older ROM versions you cannot put a procedure inside another but in that case there should also be error messages in the procedure "bild(wer\$,ZAL)" in line 2250, because this one has the local procedures.

It is not important that the "def proc erg" should be inside the "def proc wo". The cure could be to delete

Editor's notebook

THE amount of grief and anxiety occasioned in parts of the QL world by the uncertainty surrounding CST and the Thor is a sorry sight to see. Although everybody has an opinion and more snippets of 'news' arrive weekly, so far as *QL World* is concerned the real news will be that the Thor is emerging from a new production line and is ready to take on all comers. That should be possible. The players have to work it out.

Tremors shook this office a few hours ago when I found that my Prog Log was missing. It may look like a swatch of old letters covered in scribble but it is the entire key to all our programs — names, dates, priorities, author queries. Fortunately, it was recovered.

Before anybody asks the obvious question, some things are easiest to access on paper. Computers are for compressing, manipulating and duplicating information. If you do not need that, use a card file, as one hard-bitten DP professional told me recently. Data on disc is far easier to lose; mdvs can fall out of the back of the drawer as well.

That may be so but I think I shall have a quiet word with the photocopier about a back-up.

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SuperBasic can perform very flexible parameter passing. Machine code routines like PRINT and INPUT can take any number of parameters, making appropriate use of names, separators and all three data types. Unfortunately that flexibility is inaccessible to the Basic programmer. When you write a procedure in Basic there is no easy way to check the format of the calling line. If parameters are missing or out of order, your procedure is likely to stop with an error message.

This month DIY Toolkit comes to the rescue, with five new routines which let you check parameter details on any QL, plus a detailed example which shows some of the new and useful things you can do as a result.

You can test whether a variable has a value, avoiding errors after CLEAR, and check the punctuation used between parameters when a pro-



cedure or function is called. You can read the types of parameters and find the text of name parameters, so file-names can be typed without quotes.

The functions are written to work reliably on any QL-compatible computer, including the CST Thor and Thor XVI. They will not work in programs compiled with Turbo or Supercharge, because those compilers do not pass parameters in the same way as the SuperBasic interpreter.

The function UNSET (variable) can be used at any time to find whether or not a name has a value associated with it. Unset names show the value "*" when you PRINT them.

UNSET gives a result of one if the name has no value and would cause an error if used in a calculation. Otherwise it returns to zero.

PARHASH, PARTYPE and PARSEPA are designed for checking parameters supplied to a SuperBasic routine. They all expect a name as a parameter — one of the parameter

DIY TOOLKIT

This month, Simon Goodwin produces five new routines which allow programmers to check parameter details within SuperBasic.

Label	Op	Defn	Comments	Code	Comments			
check	move.w	#110, a2	INIT vector	bad_parm	moveq #+15, d0	Parameter error		
	and	(a2)			not_found	moveq #+7, d0	Not found error	
get_parm	move	a0, d0	Get ADDR of param		parm_err	moveq #110, d0	PAR. GT INT	
	move	d0, a2	Check value			jsr	(a2)	Get parameter
	do.b	5, #INSET				check	exit	Exit if AMQL
	do.w	partype	Check partype			subq.w	#1, d3	Check param count
	do.w	parhash	Check for hash			move.w	bad_parm	Only one expected
	do.w	parhash	Check separator			move.w	0(a1, a6, 1), d0	Fetch value
	do.w	parhash	Check separator			subq.w	#1, d0	Count from 0
	do.w	parhash	Check separator			move.w	bad_parm	Reject if
	do.w	parhash	Check separator			move.w	#3, d0	+ 8 for NT offset
	do.w	parhash	Check separator			move.w	0(a1, a6), a0	A0 -> Return stack
	do.w	parhash	Check separator			test.b	-8(a0, a6, 1)	Check call type
	do.w	parhash	Check separator			beq.s	not_found	Reject 60 SUBS
	do.w	parhash	Check separator			move.l	-24(a0, a6), a2	A2 -> First param
	do.w	parhash	Check separator			move.l	-20(a0, a6, 1), d1	D1 -> First local
	do.w	parhash	Check separator			sub.l	a2, d1	D1 = param space
	do.w	parhash	Check separator			cap.w	d1, d1	Check offset
	do.w	parhash	Check separator			bcc.s	not_null	Parameter missing
	do.w	parhash	Check separator			add.w	a0, a2	A2 -> chosen entry
	do.w	parhash	Check separator			moveq	#0, d1	Check for late QLs
	do.w	parhash	Check separator			trap	#1	Call NT.INF
	do.w	parhash	Check separator			cap.l	#*1.03, d2	DDOS 1.03 or less?
	do.w	parhash	Check separator			bits.s	no_tweak	Leave "AM" & "JM"
	do.w	parhash	Check separator			adda.l	24(a6), a2	A2 := A2 + NT.BASE
	do.w	parhash	Check separator			move.w	2(a6, a2, 1), d0	Get NT pointer
	do.w	parhash	Check separator			bits.s	ret_null	Value parameter?
	do.w	parhash	Check separator			lsl.w	#7, d0	Index into NT
	do.w	parhash	Check separator			move.l	24(a0, a2)	A0 -> Name table
	do.w	parhash	Check separator			adda.w	a0, a2	A0 -> Name entry
	do.w	parhash	Check separator			move.w	2(a0, a2, 1), d0	Name list offset
	do.w	parhash	Check separator			bits.s	bad_parm	No name set up
	do.w	parhash	Check separator			move.l	32(a0), a2	A2 -> Name List
	do.w	parhash	Check separator			adda.w	d0, a2	A2 -> Name text
	do.w	parhash	Check separator			moveq	#1, d4	Get name length
	do.w	parhash	Check separator			add.b	0(a2, a6, 1), d4	Make it even
	do.w	parhash	Check separator			move.l	#0, d4	D4 = space needed
	do.w	parhash	Check separator			move.w	d4, d1	BV.CHRT
	do.w	parhash	Check separator			move.w	#11, a0	Check for space
	do.w	parhash	Check separator			jsr	(a0)	Get new maths SP
	do.w	parhash	Check separator			move.l	056(a6), a1	Allocate space
	do.w	parhash	Check separator			sub.l	d4, a1	Set BU.BP
	do.w	parhash	Check separator			move.l	a1, #58(a6)	Clear length MSB
	do.w	parhash	Check separator			move.w	#0, d1	Get length +255
	do.w	parhash	Check separator			move.w	0(a6, a2, 1), d1	Stack length
	do.w	parhash	Check separator			move.w	d1, #1(a6, 1)	Stack length
	do.w	parhash	Check separator			copy_char	1(a6, a2, 1), 2(a0, a2)	
	do.w	parhash	Check separator			addq.l	#1, a2	Advance in name
	do.w	parhash	Check separator			addq.l	#1, a1	Advance in char.
	do.w	parhash	Check separator			subq.w	#1, d1	Count down to 1
	do.w	parhash	Check separator			bits.s	copy_char	
	do.w	parhash	Check separator			net_string	moveq #1, d4	Result is a string
	do.w	parhash	Check separator			moveq	#0, d0	No error
	do.w	parhash	Check separator			rts		
	do.w	parhash	Check separator			net_null	clr.w 0(a1, a6, 1)	Re-use INT space
	do.w	parhash	Check separator			bits.s	ret_string	
	do.w	parhash	Check separator			end		

names from the DEF line of the current routine.

PARHASH(param) gives 1 if the parameter value was preceded by a hash character, #, on the line calling the routine. PARTYTYPE(param) indicates the type of the value, returning 1 for strings, 2 for decimals and 3 for integers.

The 'type' of an unset variable is determined by the last character of its name. PARTYTYPE gives zero if two separators are entered without a value between them.

PARSEPA(param) tells you what separator followed parameter value on the calling line. Zero indicates the end of the line; 1 means a comma, 2 indicates a semi-colon, 3 a backslash, 4 an exclamation mark and 5 means 'TO'. You can use separators to

labelled DEFINE gives the names and addresses of all five functions.

PARHASH, PARSEPA, PARTYTYPE and UNSET all return numbers from the Name Table, given a variable name, so it makes sense for them to share code. When differences are required the program checks D7, used as an indicator to show which particular result is required.

The code checks for a single parameter, then reads the index number of the parameter from the Name Table, at 2(A3.A6.L). This binary number is shifted three places left, multiplying it by eight, the length of one entry in the name table.

BV.NTBAS, 24(A6), is added, giving the offset of the parameter in the Name Table. Then D7 is tested to determine which part of the Name

at the end of the Return Table. The Return Table is always accessed from the end at high addresses, scanning backwards, so negative offsets are used when looking through the table.

When a subroutine call occurs the last seven bytes of the entry are set to show from where the code was called and to record any 'short forms' active on the line. Procedure and function calls have distinct values in the eighth byte, indicating that there is extra information in 16 bytes at lower addresses.

When a procedure call occurs, SuperBasic must associate each parameter value with a name in the procedure definition. All names in SuperBasic have an entry in two tables — the Name List, which holds the text of each name, and the Name Table, which holds the name type and pointers to the text and value.

When a call occurs, SuperBasic grabs temporary slots in the Name Table for each parameter supplied. It then swaps the values in those slots with those for the variables in the DEF line, leaving the Name List pointers unchanged. Thus the names in the DEF line become associated with the parameter values. If those names had values previously their details wind up in the temporary slots for safe keeping until the procedure has finished.

Temporary slots

The interpreter continues scanning through the program, looking for LOCAL lines. Once again, temporary slots are set up for each LOCAL. At first the slots do not indicate any particular value. They are swapped with the entries for the relevant name, so the old value is saved and the name becomes 'unset', ready for local use in the body of the procedure.

When the procedure terminates, SuperBasic needs to restore the old local and parameter values from the temporary slots. That is where the other information in the Return Table is useful. The table contains pointers to the temporary slots and the line number of the start of the routine.

First, the DEF line is found and scanned for names. The parameter name details are swapped back; if the original parameter is a name rather than an expression, it takes the new value, so that procedures can pass values back to the calling routine.

The original value of each LOCAL variable is retrieved by swapping its Name Table entry with the corresponding temporary slot. Finally, all the temporary slots are de-allocated, along with the Return Table entry.

There is a problem; Sinclair changed the format of the pointers to

Table 1. Return Table entry format. These 16 bytes are used only by procedures and functions:

Offset	Size	Description
-24	LONG	Name Table offset of first parameter entry
-20	LONG	Name Table offset of first local entry
-16	LONG	Name Table offset of end of local entries
-12	WORD	LINE NUMBER of called DEFine statement
-10	BYTE	FUNCTIONTYPE; 1 = string, 2 = decimal, 3 = integer
-9	BYTE	SWAP FLAG; set when parameters are ready

These 8 bytes are used by all subroutine calls:

-8	BYTE	CALL TYPE: 0 = GO SUB, 1 = Procedure,
-7	BYTE	3 = Function
-6	WORD	STATEMENT NUMBER on calling line, 1-255
-4	BYTE	LINE NUMBER of calling line, 1-32767
		SHORTBLOCK TYPE: 1 = FOR/REP, 255 = SEL/IF,
-3	BYTE	0 = none
-2	WORD	CALL FLAG: 255 = direct command, 0 = in program
		Name Table index of short FOR or REPEAT loop

pass extra information to a procedure or function, as the built-in PRINT command does.

PARNAME\$ is the odd one out, in that it takes the number of a parameter — from 1 to the number of parameters supplied — and returns the name of the variable used at that position on the calling line. Thus you can read names without requiring them to be entered in quotes.

Ideally you would expect PARNAME\$ to translate the name from the DEF line into the parameter name used in the call. In practice it is much easier to work with a parameter number rather than a name, for reasons which become clear when we examine the way SuperBasic parameter-passing works.

The assembly code is in listing one. The first half should seem straightforward to regular readers. The START routine calls BP.INIT, the ROM vector which adds new functions to SuperBasic. The table

Table entry should be returned; UNSET tests the value pointer, while the other functions extract information from the type byte.

PARNAME\$ is rather different. It takes a parameter number and converts it into a name string, using information in the interpreter 'return turntable.' Like many interpreter data structures, the Return Table was never fully-documented by Sinclair. SuperBasic uses the table to keep track of local variables and parameters and to find its way back from a subroutine to its caller.

The Return Table contains an entry for every active procedure, function or subroutine call. GO SUB needs only eight bytes but DEFINED routines need 24 bytes to cope with parameter and local variable details. Table 1 shows the contents of one Return Table entry, determined by experiment.

The system variable BV.RTP, 60(A6), points at the first unused byte

temporary slots partway through the life of the QL. Early AH and JM machines store the address of the slot relative to the start of Basic, while JS and MG systems store the offset from the start of the Name Table.

PARNAME\$ sorts this out by calling MT.INF and checking the Qdos version number. This is 1.02 for AH and 1.03 for JM, versus 1.10 and 1.13 for JS and MG.

PARNAME\$ fetches its parameter in the normal way, then reads the pointer from the Return Table, giving a 'no found' error if the Table is empty. Then it calls MT.INF. If the version number is greater than 1.03, it adds the base address of the Name Table to the pointer value. The parameter value is multiplied by eight — the size of a Name Table entry — and used as an index into the temporary slots.

PARNAME\$ returns an empty string if the number you supply is more than the actual number of parameters, or the corresponding parameter was a value rather than a name. Otherwise it looks up the name text in the name list, checks there is room for it on the Maths Stack and returns with the name stacked as a string.

The code for the parameter routines is listed in two forms. Listing one is the source text, assembled using the HiSoft *DevPac*. You can type this text into your own assembler if you want to customise the code or tweak it to see how it works.

Listing 2 provides a quick way to enter the code without using an assembler. It loads the equivalent machine code from DATA statements and saves it in a file.

The first part of listing two is Marcus Jeffery's hex loader, used in each month's DIY Toolkit project. Only the DATA, from line 590 onwards, changes from month to month. When you RUN listing two the data is read and checked. A message appears if you have made a typing mistake. Otherwise it asks you to enter the device and file-name and creates a concise code file. You must load the code file before loading Basic programs which use the new functions. These three commands will load the code:

```
base = RESPR(344) : LBYTES "file
name",base : CALL base
```

Once you have typed these commands you can use PARHASH, PARNAME\$, PARSEPA, PARTYPE and UNSET in your programs.

A bug in the interpreter means that your program may be corrupted if



```
100 REMark Sinclair QL World HEX LOADER
110 REMark by Marcus Jeffery & Simon N Goodwin
120 :
150 CLS: RESTORE : READ space: start=RESPR(space)
160 PRINT "loading Hex..." : HEX_LOAD start
170 INPUT "Save to file...";f$
180 SBYTES f$,start,byte : STOP
190 :
200 DEFine FuNction DECIMAL(x)
210 RETurn CODE(h$(x))-48-7*(h$(x)>"9")
220 END DEFine DECIMAL
230 :
240 DEFine PROCedure HEX_LOAD(start)
290 byte = 0 : checksum = 0
300 REPeat load_hex_digits
310 READ h$
320 IF h$="*" : EXIT load_hex_digits
330 IF LEN(h$) MOD 2
340 PRINT"Odd number of hex digits in: ";h$
350 STOP
360 END IF
370 FOR b = 1 TO LEN(h$) STEP 2
380 hb = DECIMAL(b) : lb = DECIMAL(b+1)
390 IF hb<0 OR hb>15 OR lb<0 OR lb>15
400 PRINT"Illegal hex digit in: ";h$ : STOP
420 END IF
430 POKE start+byte,16*hb+lb
440 checksum = checksum + 16*hb + lb
450 byte = byte + 1
460 END FOR b
470 END REPeat load_hex_digits
480 READ check
490 IF check <> checksum
500 PRINT"Checksum incorrect. Recheck data.":STOP
520 END IF
530 PRINT"Checksum correct, data entered at: ";start
560 END DEFine HEX_LOAD
570 :
580 REMark Space requirements for the machine code
590 DATA 344
600 :
610 REMark Machine code data
620 DATA "43FA000A34790000","01104ED200000000"
630 DATA "0005003405554E53","4554003007504150"
640 DATA "54595045002A0750","4152484153480024"
650 DATA "0750415253455041","0082085041524E41"
660 DATA "4D45240000007E00","600A7E0160067EFF"
670 DATA "60027EFE518DBBCB","66583033E8026B52"
680 DATA "E748246E0018D4C0","4A476B12670B7E0F"
690 DATA "0E32E831601F4A72","E8046B1660165247"
700 DATA "676A7E7FCE32E801","E84F60084A32E801"
710 DATA "6A027E0172023079","0000011A4E90226E"
720 DATA "005855892D490058","3387E80078037000"
730 DATA "4E7570F14E7570F9","4E75347900000112"
740 DATA "4E9266F4534366EA","3031E80053406BE2"
750 DATA "E748206E00304A30","E8F867DA2470E8E8"
760 DATA "2230E8E0928AB041","6468D4C070004E41"
770 DATA "B4BC312E30336304","D5FE00183036A802"
780 DATA "6B50E748206E0018","D000303688026BA2"
790 DATA "246E0020D4007801","D832E80008840000"
800 DATA "220430796000011A","4E90226E00589304"
810 DATA "2D49005872001236","A8003381E8001DB6"
820 DATA "A8019802528A5289","534166F278017000"
830 DATA "4E754271E80060F4","*",29121
```

```

100 REMark Columnar CAtalogue command v 0.6
110 REMark Copyright Simon N Goodwin 12/9/88
120 :
130 DEFine PROCedure CAT(p1,p2,p3)
140 LOCAL max_chars%, col_width%, name$(36)
150 REMark GLOBALs drive$, chan%, cols%
160 :
170 IF UNSET(p1)
180   drive$=PARNAME$(1)
190 ELSE
200   IF PARTYPE(p1)=1
210     drive$=p1
220   ELSE
230     .IF PARHASH(p1) : chan%=p1 : ELSE cols%=p1
240   END IF
250 END IF
260 IF PARSEPA(p1) AND UNSET(p2) : drive$=PARNAME$(2)
270 IF PARTYPE(p2)=1 : drive$=p2
280 IF PARTYPE(p2)>1 AND NOT UNSET(p2) : cols%=p2
290 IF PARTYPE(p3)>1 AND NOT UNSET(p3) : cols%=p3
300 :
310 IF UNSET(chan%) : chan%=1
320 IF UNSET(cols%) : cols%=3
330 IF UNSET(drive$) : drive$="f1p1 "
340 IF cols%<1 : PRINT #0;"Bad CAT parameter" : STOP
350 :
360 OPEN #15,pipe_4000
370 DIR #15,drive$
380 QLINK #15 TO #14
390 CLOSE #15 : REMark Mark end of file
400 :
410 REMark Compute maximum number of characters per line
420 IF chan%<3
430   max_chars%=CHAN_W%(chan%,28) DIV CHAN_W%(chan%,38)
440 ELSE
450   max_chars%=64 : REMark Arbitrary file line width
460 END IF
470 max_chars%=max_chars%+2*(1-cols%)
480 col_width%=max_chars% DIV cols%
490 IF col_width%<2 : PRINT #0;"Bad CAT parameter" : STOP
500 :
510 col%=0 : REMark Column numbers are 0 to (cols%-1)
520 REPEAT tab
530   IF EOF(#14):EXIT tab
540   INPUT #14,name$
550   IF col%=0 : PRINT #chan% : ELSE PRINT #chan%;" ";
560   IF LEN(name$)>=col_width%
570     PRINT #chan%;name$(1 TO col_width%);
580   ELSE
590     PRINT #chan%;name$;FILL$(" ",col_width%-LEN(name$));
600   END IF
610   col%=(col%+1) MOD cols%
620 END REPEAT tab
630 CLOSE #14
640 END DEFine

```

you use more than nine parameters or local variables in a single definition. This bug occurs only in versions AH, JM, JS and JSU of the QL ROM but unfortunately most people have those versions.

Listing 3 is an improved version of CAT, the demonstration routine introduced last month. As we left it, CAT formatted the output of DIR into neat columns across the screen, using the full width of window #1. The new version allows extra parameters — a channel number preceded by hash, a device name, and the number of columns.

All the parameters are optional; you can use them in any combination so long as they are specified in the correct order, so the possibilities are CAT, CAT 4, CAT #0, CAT MDV1—, CAT #3,MDV2—, CAT #2,2 , CAT RAM1—,6, CAT #4,FLP2—,5.

The DIY Toolkit functions make it easy to write this flexible command in SuperBasic. You can go even further if you wish, taking special account of separators, just like PRINT and other built-in commands.

Lines 170 to 290 test the 'dummy' parameters P1, P2 and P3 and sort them out, setting global variables

drive\$, chan% and cols% appropriately. If parameters are absent the previous value is taken as the default, so you have only to type a drive name when changing from one drive to another. Subsequent CAT commands default to that drive until you choose another. Channel numbers and column counts are preserved in the same way.

The CLEAR command destroys the latest settings but it does not stop CAT working; it just re-sets it to its initial default settings. If an option is not set when line 310 is reached, the default values are used — channel one, floppy disc one, three columns. Edit lines 310-330 to change the defaults to suit yourself.

You must have a hash before the channel number or it will be treated as a column-count. You can use numeric variables or calculations instead of explicit numbers, as normal.

CAT complains 'Bad CAT parameter' if you ask for less than one column or more than will fit on a line. Each column is at least two characters wide, with a two-character gap between columns.

The drive name does not have to be in quotes, although strings and string expressions are allowed. If your QL allows wild-card DIR commands you can use the same options with CAT, for instance:

CAT FLP1-BAS,4

gives a four-column listing of files with names ending —BAS, on most disc systems.

CAT uses channels 14 and 15 internally. Line 380 uses last month's DIY Toolkit command QLINK to set up an input pipe, so you must load last month's code file before typing-in CAT.

Line 430 uses CHAN-W% to determine the width of the console channels #0, #1 and #2, taking account automatically of CSIZE and window dimensions. Channels 3 and above might not be windows, so CAT assumes a pre-set width of 64 characters. Change this if it does not suit you.

The code for CHAN-W% was listed in the May DIY Toolkit. If you do not have that code omit lines 420, 430, 440 and 460, so that the pre-set width is always used.

I will present more code and commentary in the December *QL World*. If you would like me to explore a specific area in this column, or implement new commands, particularly ones unavailable in commercial toolkits, please send suggestions.

Ron Massey catches up on some Quartet Questions.

PSION

Listing 1: Complete page formatter for Quill:

```
1 TK2_EXT : REMark ** Omit this line if running
    Toolkit II from software **
2 REMark The following is input as a single line
3 ALTKEY 'f',CHR$(240)&'d'&'p'&'r'&'s',CHR$(240)&'f'&CHR$(32)&CHR$(32),CHR$(240)&'m'&CHR$(32)&CHR$(192)&CHR$(192)&CHR$(192)&CHR$(192)&CHR$(192)&CHR$(192)&CHR$(200)&CHR$(200)&CHR$(200)&CHR$(200)&CHR$(200)&CHR$(200)&CHR$(200)&CHR$(200)&CHR$(200)&CHR$(200),''
```

Listing 2: Keys for formatting a Quill page:

```
1 ALTKEY 'f',CHR$(240)&'f'&CHR$(32)&CHR$(32),'' :
2 REMark <ALT><f> = <F3><f><SPACE><SPACE><ENTER>
3 ALTKEY 's',CHR$(240)&'d'&'g'&'o','' :
    REMark Single line space- <ALT><s> =
4 REMark <F3><d><g><o><ENTER>
5 ALTKEY 'p',CHR$(240)&'d'&'g'&'i','' :
    REMark Double line space- <ALT><p> =
6 REMark <F3><d><g><i>
```

Listing 3: Keys for use within Quill and single-key typeface changes:

```
10 ALTKEY 'i',CHR$(244)&'i','' :
    REMark Set Italics
11 ALTKEY 'h',CHR$(244)&'h','' :
    REMark Set Condensed
12 ALTKEY 'b',CHR$(244)&'b','' :
    REMark Set Bold
13 ALTKEY 'u',CHR$(244)&'u','' :
    REMark Set Underline
14 ALTKEY '[',CHR$(244)&'h' & CHR$(146) :
    REMark Condensed Subscript On
15 ALTKEY ']',CHR$(244)&'h' & CHR$(148) :
    REMark Condensed Sub/superscript Off
16 ALTKEY '^',CHR$(244)&'h' & CHR$(147) :
    REMark Condensed Superscript On
17 ALTKEY 'e',CHR$(244)&'b' & CHR$(144) :
    REMark Expanded On
18 ALTKEY 'o',CHR$(244)&'b' & CHR$(141) :
    REMark Expanded Off
```

Listing 4: Keys for use within The Editor only:

```
19 ALTKEY '.',CHR$(240)&'bs','' :
    REMark Block start <ALT> .
20 ALTKEY ',,CHR$(240)&'be','' :
    REMark Block end <ALT> ,
21 ALTKEY 'v',CHR$(240)&'b','' :
    REMark Bottom <ALT><v>
22 ALTKEY '\,CHR$(240)&'t','' :
    REMark Top <ALT><\>
23 ALTKEY "=",CHR$(240)&'ck','' :
    REMark Start of block
24 ALTKEY "!",CHR$(240)&'cb','' :
    REMark End of block
25 ALTKEY '- ',FILL$('-',83),'' :
    REMark print "-" 83 times.
```

Listing 5: Keys for putting date into a document:

For an alphanumeric "16 July 1988" date format:

```
1 REMark Set the QL's clock with the SDATE command
2 Date_key : REMark To call procedure-
3 REMark Insert the rest of your boot here and
4 REMark add the following at the end of the boot,
5 REMark with suitable line numbers.
27 DEFine PROCEDURE Date_key
28 LOCAL i
29 dt%=DATE$
30 RESTORE 34
31 FOR i=1 TO 12:READ a$:IF dt$(6 TO 8)=a$(1 TO 3):EXIT i
32 REMark 6 x TAB, then print date
33 ALTKEY "d",CHR$(9)&CHR$(9)&CHR$(9)&CHR$(9)&CHR$(9)&CHR$(9) & dt$(10 TO 12) & a$ & dt$(1 TO 4),'',''
34 ALTKEY "D",CHR$(9)&CHR$(9)&CHR$(9)&CHR$(9)&CHR$(9)&CHR$(9) & dt$(10 TO 12) & a$ & dt$(1 TO 4),'',''
35 DATA "January ","February ","March ","April ","May ","June ","July ","August ","September ","October ","November ","December "
36 i=CODE(INKEY$(#2,10))
37 END DEFine
38 :
```

Whether your QL is cartridge- or disc-based, expanded or not, organising your media is the first step towards saving yourself considerable effort and ensuring that you have any add-on routines, in the order you wish to run them, available when starting up a program.

Boots supplied with commercial programs are adequate to start but, by adding a few additional lines to the work copies of media boots, you can add special features to the programs you are running.

Because of the varied nature of the work I do with the QL, my disc boots offer a sequence of options, defaulting to YES, before I can access any of the programs

available from their menus. Starting DP *Lightning*, initialising QJump *Toolkit II* and setting the date are common to all my discs.

Ensuring that the QL clock is set to the current date is important for the QL date-stamping files, a feature available with many toolkits, correctly with the current date and time. This simplifies checking files at some future time. Any of my work discs containing programs written in Basic also start the Liberation Software *QLoad*, thereby reducing loading time to almost the equivalent of machine code programs.

Once you have organised your media to your satisfaction your second consideration should be to utilise one or more of the many superb utilities available for the QL

fully. If nothing else, the majority of QL utilities include features which can reduce or eliminate much of the typing required for setting-up or navigating in the majority of commercial programs.

Defaults

One of the most common complaints passing my desk concerns the choice of default options offered by Psion for its suite of programs. Although much of the correspondence fails to detail exact complaints, I would assume that they mean, singly or in combination, formatting a document, inputting frequently-used blocks of text or keying commands sequentially.

For reasons too numerous to detail it is amazing how

frequently QL add-ons include less-than-obvious features we seldom use. Because of space allocated for editorial material and the diversity of individual requirements, it is not possible to detail specific applications but the following notes should be useful as a starting point.

There are two principal discrete program systems — and several which provide built-in features serving a similar function — designed to make using a computer simpler. The first is the Psientific

Software *Keydefine*. Since this very useful utility has been reviewed in *QL World* we can only highlight its main features. The main program module allows you to associate up to 2,000 characters, including spaces and non-

SOLUTIONS.

Listing 6: For a numerical "16/07/88" date format, use:

```

1  REMark Set the QL's clock with the SDATE command
2  Date_key : REMark To call procedure.
3  REMark Insert the rest of your boot here and
4  REMark add the following at the end of the boot,
5  REMark with suitable line numbers.
27 DEFINE PROCEDURE Date_key
28 LOCAL i
29 dt$=DATE$
30 RESTORE 35
31 FOR i=1 TO 12 : READ a$ : IF dt$(6 TO 8)=a$ :
EXIT i : REMark dt$(6 to 8) = month
32 mn$=i : IF LEN(mn$)<2 : mn$="0"&mn$ :
REMARK i = month in numerical values
33 ALTKEY "d",dt$(10 TO 11) & "/" & mn$ & "/" &
dt$(3 TO 4),",",",",",":
REMARK dt$(10 to 12) = day
34 ALTKEY "D",dt$(10 TO 11) & "/" & mn$ & "/" &
dt$(3 TO 4),",",",",",":
35 DATA "Jan","Feb","Mar","Apr","May","Jun",
"Jul","Aug","Sep","Oct","Nov","Dec"
36 i=CODE(INKEY$(#2,10))
37 END DEFINE
38 :
```

printing characters, on each of 41 keys. When you press <ALT> and the required key the characters associated with the key are, in effect, typed-in for you. Keydefine could not be simpler to use and can save a considerable amount of typing.

Operations

Some programs reserve <ALT> and other keys for their operations. *Taskmaster*, as one of them, includes a separate small Basic routine which will re-define the Keydefine call-up key as <ALT> <SHIFT>.

Taking a different approach, one of the most popular toolkits produced for the QL which almost everyone with a disc interface has at their disposal, is Tony Tebby's Toolkit II. Alternatively, it is also supplied as a plug-in EPROM and as a solely software-based form on cartridge.

A careful study of the Toolkit II user guide reveals a number of useful commands which extend the QL repertoire considerably. One of the commands, with almost universal appeal and one which is least often used, is the TK II ALTKEY command.

In addition to re-inputting the last indyped, with <ALT> <

ENTER>, almost the entire QL keyboard can have commands and/or large blocks of text associated with single keypresses.

Initialising TK II built into most disc interface systems is done by typing "TK—EXT". This command also links in the other TK II extensions. The ALTKEY command works by defining a command key, which is case-sensitive — meaning you have to specify upper- and /or lower-case — followed by a comma and the string of characters which are to be associated with the key.

If the command key is a printable character you must specify the key within single or double quotes. Alternatively, you can use the QL chr\$ codes instead. A table of the codes is included in the QL User Guide.

ALTKEY may be used in many ways, whether you are programming or wish to add a degree of "automation" to any kind of program. You can also have several versions of ALTKEY for different applications.

Setting-up ALTKEYs is simple and the exact format you will need will depend on what you are hoping to accomplish. The characters following the command key can be stated in one of three forms, the form depending on

Listing 7: For day, date in alphanumeric "Sunday, 16 July 1988" format:

```

100 DEFINE PROCEDURE Date_key
110 LOCAL i,d
120 dt$=DATE$ : dy$=DAY$ : REMark dt$(10 to 12) =
Day; a$ = Month; dt$(1 to 4) = Year
130 RESTORE
140 FOR i=1 TO 12 : READ a$ : IF dt$(6 TO 8)=a$(1
TO 3) : EXIT i
150 FOR d=1 TO 7 : READ b$ : IF dy$(1 TO 3)=b$(1
TO 3) : EXIT d
160 ALTKEY "d",b$&dt$(10 TO 12)&a$&dt$(1 TO 4),",",
",",":
170 ALTKEY "D",b$&dt$(10 TO 12)&a$&dt$(1 TO 4),",",
",",":
180 DATA "January ","February ","March ","April ",
"May ","June ","July ","August ","September ",
"October ","November ","December "
190 DATA 'Monday, ','Tuesday, ','Wednesday, ','Thu
rday, ','Friday, ','Saturday, ','Sunday, '
200 i=CODE(INKEY$(#2,10))
210 END DEFINE
```

how the command is to be executed:

1. ALTKEY "1", "DIR flp1—"
2. ALTKEY "1", DIR flp1—"
3. ALTKEY "1", chr\$(240) & "1" & "?"

The first example will input "DIR flp1—" on the command line in window #0 and wait for you to press <ENTER>. Alternatively, if you are using that command while you are programming, pressing <ALT> <1> will input "DIR flp1—" next to the current line number. In the second example, pressing <ALT> <1> will input "DIR flp1—" and a newline (<ENTER>) as well, executing the command.

If you are entering commands into programs such as Quill, you must concatenate

your command sequences by inserting "&" between each command because ALTKEY enters an implicit newline between strings separated by commas. In the third example effectively you are pressing <F3> <1> <?>, telling Quill to do a directory from the LOAD command level.

Typically, formatting a Quill document can be assigned to a single key and takes about 10 seconds to complete, using the following line which can be added anywhere near the beginning of a boot program as a single program line, provided you have the QJump Toolkit II available first.

After running that line from the Quill boot, pressing <ALT> and <f> together will enter the following sequence of commands into Quill:

Command	Input into Quill
chr\$(240)	<F3>
"d"	Design options.
"p"	Page length select.
"68"	Length to 68 lines.
.....	Implicit line feed- <ENTER>.
"u"	Upper margin.
"0"	No upper margin.
.....	Explicit line feed.
chr\$(240)	<F3>
"f"	Footer.
chr\$(32) — two times	<SPACE> twice-Footer to None.
.....	Implicit line feed- <ENTER>.
chr\$(240)	<F3>
"m"	Margins.
chr\$(32)	Skips from left margin to indent.
chr\$(192) — Five times	Moves indent five columns left.
chr\$(32)	<SPACE> -Set right margin.
chr\$(200) — 11 times	Moves right margin to column 81.
.....	Implicit line feed.
.....	Explicit line feed.

Do you wonder sometimes what to do with your QL? Do you feel that computer magazines are like some motoring magazines — they describe machinery which is state-of-the-art but none of the readers will ever afford to buy such hardware? If so, this article may interest those with an interest in amateur photography.

I am a hospital doctor and part of my job involves presenting the results of our department's research to doctors attending national and international meetings. The three main objectives are to present up-to-date information, to present it clearly and to prepare the slides with minimal fuss and delay.

Most of the data can be presented in the form of bar charts or pie diagrams. A few text-only slides are needed for the introduction and the conclusion.

The traditional way to prepare a suitable set of slides is to approach the illustration department with a collection of roughly-drawn bar charts and a smiling face. The graphs are then re-drawn and photographed by professionals. A few weeks later you may collect your final product. The result is a magnificent set of slides. The main problems with this system are that it takes a long time before you see how the slides will appear on-screen and if any alterations are required the whole process starts again with a fresh set of drawings.

I discovered an alternative system in May, 1985, when I bought a Sinclair QL



QL PICTURE SHOW

computer with a medium-resolution colour monitor. Early experience with Easel indicated the potential to overcome the problems described. After some experiments I evolved the following procedure.

Load Easel and change to 40-column mode because the text is larger and the choice of colours is much better. This voluntary restriction of text helps to keep the slides intelligible for the viewers. Many a good presentation has been spoiled by trying to cram too much information on to each slide.

Enter your data in the usual fashion to appear on the monitor screen. Do most of your editing while in Easel and pay particular attention to your choice of colours. Try to maintain good contrast of colours, e.g., yellow ink on blue paper. Colours which may have sufficient contrast on your monitor can be rather disappointing on a lecture theatre screen, such as yellow next to green, yellow next to white and blue next to black.

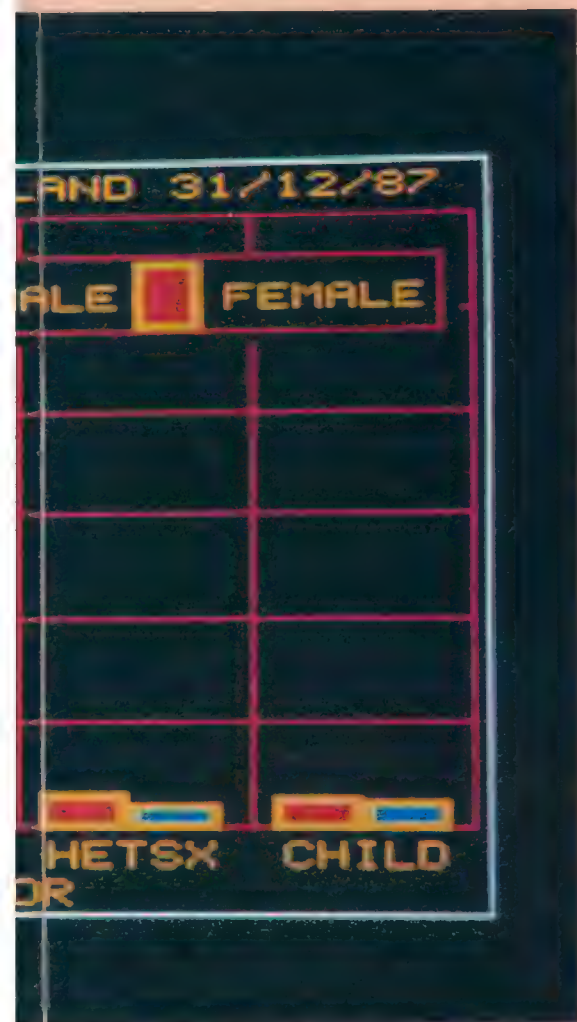
Dr Tony Francis uses his QL for making 35mm slides to illustrate his lectures. Here he describes the process.

I remove the prompts <F2> at the start of a session for two reasons. I do not want them to appear on the slide and, more important, the position of text relative to the graph changes when you switch the prompts on/off is very irritating when you first discover this feature. When you have finished your editing in Easel you will probably photograph the screen as it is. Press <ESC> to get out of the command mode, then <SHIFT> <F2> to remove the junk from the bottom of the screen and proceed to the photography section.

Those wanting to make more alter-

ations prior to photography should save the screen to Microdrive/floppy by selecting the "Print" command and choosing the "S" option — screen dump to file. This saves the screen in a file with the extension —pic. Now exit from Easel and load Digital Precision Eye Q. Change to low-resolution mode and load the —pic file you have just saved in your Easel session. Now you can do almost anything to your screen, such as re-colour with stipples and touch up any of the rough problems. Further, you can draw or write on the top and bottom parts of the screen which Easel regards as forbidden territory — the "Control" and "Status" areas. When you have finished your Eye Q editing session save your screen again with a —pic extension and then move on to photography.

I soon discovered that the default graph offered when Easel is first loaded was not suitable for most of my work. Now I have deleted all the pieces I do not need, set the ink, paper, graph paper and axis to the style I prefer and saved it to



disc as "BLANK—grf". After booting Easel I then load BLANK—grf and everything is set the way I like it.

For text-only slides you can use Easel but I prefer to start with Eye Q and keep a set of standard backgrounds on disc.

One of the pleasant things about these programs is that they never complain or suggest you have been indecisive. The picture on the monitor is photographed using a 35mm. single lens reflex camera fitted with slide film. Almost any slide film can be used. I mount the camera on a tripod about two metres from the monitor and make sure the centre of the camera lens is on the same level as the centre of the monitor. This is best done by measuring the distance from the floor to the centre of the monitor screen and then adjusting the tripod so that the floor-to-centre-of-lens distance is the same. It is important to tilt the monitor so that its screen is vertical.

Those who have tilt and swivel monitors will have no problems getting screens vertical but the rest of us have to wedge half a telephone directory or a suitable block of wood under the rear feet of the monitor. I use a telephoto zoom lens and usually set it to 170mm. Taking the photo with this lens at this distance helps to reduce the distortion from the slight curve on the monitor screen.

Obviously it is important to adjust the lens or camera distance to make sure that the monitor is emitted light not reflected light, so the photography must be done in a darkened room and flash must not be used. Do not turn up the brightness control too much because it can produce a flare round the letters which makes them less distinct.

The vertical scan rate of most monitors will refresh the image 50 times every second, so it is important to set the camera shutter speed to include about 20 scans, i.e., about half a second. Anything less than half a second makes part of the slide over-exposed and the other part under-exposed.

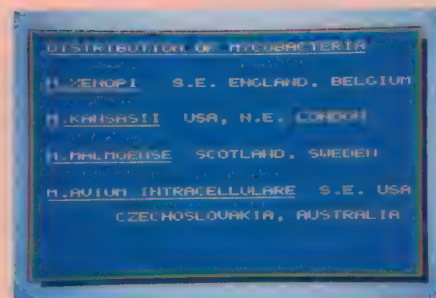
With an exposure time set to half a second I then use the camera automatic light meter to tell me which aperture to use. At this relatively long exposure time most films suffer from a condition called reciprocity law failure, which means they

These programs never complain that you have been indecisive. The picture on the monitor is photographed with a 35mm/SLR camera with slide film.

need slightly more light than most metering systems would suggest. The solution is to over-expose the picture slightly — half a stop will do. If the metering system suggests f11, you set the aperture to a position between f11 and f8.

When setting the exposure/aperture combination use a screen with plenty of colour on it. I keep a standard picture on disc which I use for setting up the camera at the start of a photographic session and then I do not alter the exposure settings or brightness control. With this relatively long exposure time it is extremely important that the camera and monitor remain perfectly still when the photo is taken — a sturdy tripod is essential.

I use a cable release attachment which

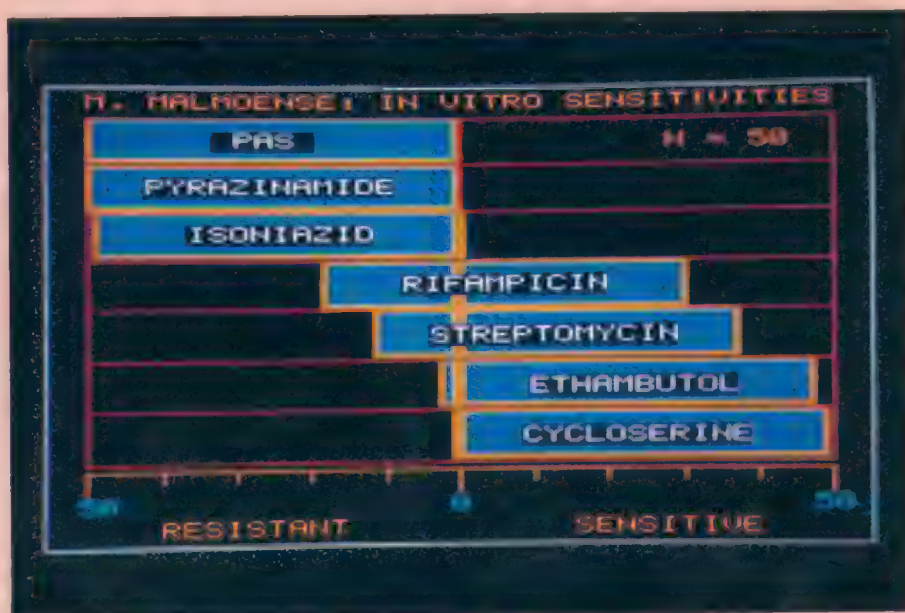


screws into the top of the shutter release button of my camera. It may seem old-fashioned but it avoids camera shake when pressing the button in the usual manner. If you do not have a cable release you could use the camera self-timer, a small lever on the front of most cameras which delays shutter opening for up to 10 seconds after pressing the button. Many cities have two-hour slide

processing services for people who are prepared to pay a little extra. Otherwise a return of post service can be used.

The cheapest option is to buy process-paid film and send it to the manufacturer for processing but it may take five days to get back your slides.

Although this method has two disadvantages in that the pictures have slight curvature distortion and the photography has to be done in a darkened room, the user may consider those disadvantages to be negligible compared to the cost of a dedicated professional system. Polaroid Palette is a dedicated high-resolution colour slide add-on for IBM-compatibles without the disadvantages I have described but it costs more than £2,000.



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DIGITAL PRECISION

PSION SOLUTIONS

C O N T I N U E D

I use the following ALTKEYS in the Taskmaster boot. I use a variant of this set if I am running Quill or *The Editor* on their own. Since I seldom use notational typefaces, I have re-defined the Psion printer driver so that selecting sub- and super-script in Quill will switch my printer to italics and condensed instead, respectively. To make switching typefaces in a document easier, I also use ALTKEY to input typeface commands.

A word of explanation may be helpful regarding the date-inputting procedure. To improve legibility, the date procedure lines have been broken into a 50-column listing. When typing them in, each line number includes the information up to the following line number. Do not forget to CALL the procedure at the beginning of the boot pro-

gram. Since my printer is set up to print in Elite typeface I usually format my documents with left margin and indent at column 10 and the right margin at column 86.

Lines 33/34 for the alphanumeric date format assign

cursor at the start of the document. The alternative procedure for inputting the date solely in numbers is shown without the TAB sequence.

Regarding the foregoing ALTKEY assignments, I use

are used only for particular programs.

If I am running Quill on its own I use a different set orientated towards Quill; the same comment applies for *The Editor*.

While designing your key array you should consider carefully whether or not the program with which you are planning to use it uses specific keys for its own purposes. Quill, *The Editor* and many other programs have keys allocated for specific functions. You should ensure that there is no conflict of interests.

If you are using ALTKEY as a programming aid I would suggest that you use characters which are mnemonically orientated, such as 'D' for DEFINE PROCEDURE, 'd' for END DEFine, 'R' for REPEAT, 'r' for END REPEAT and so on.

"Consider carefully whether or not the program with which you are planning to use this already uses specific keys for its own purposes. Ensure that there is no conflict of interests."

upper- and lower-case "d" to perform the same function. The command sequence is to TAB with chr\$(9) over the column 70 before inputting the date and then enter three linefeeds to position the

several variations of the listings, depending with which programs they are to be run. Their set is used with Taskmaster because I run two sizes of Quill alongside *The Editor* and some of the keys

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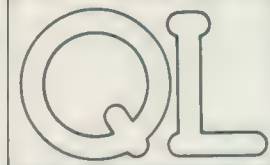


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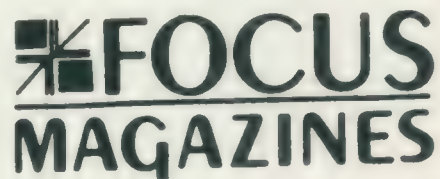
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Three years ago the idea of a home computer capable of performing in a business setting was a novel one. The QL breached the wall between machines for the home and machines for the office. The QL had pretensions to out-perform the business machines of the time, at a price the home enthusiast could afford. The aim was clearly stated through the free software with the hardware — a package which offered the promise of the office revolution in four small Microdrive cartridges. Many QL users are now in the position of using, or wanting to employ, computers in full business use.

The main advantages of the QL to the business user are the original ones. The price of entry into the computer age through the QL door is relatively modest. As needs grow, expansion and modern software developments are available at prices which make other systems look less attractive. A new business, whether it be a one-man enterprise, a voluntary organisation, or a part-time operation which may grow into something bigger, can get started with a QL. There is no need to wait for the mythical 'perfect' machine or the spare money to buy it.

It is a mistake to think that buying a computer immediately buys the office revolution. I have been in several offices in the last few months where Amstrad PWCs have been quietly gathering dust. Their purchasers were impressed by the switch-on-and-go advertising which does not recognise that there is more to computers than tapping keys. It requires time, patience, a change of attitude to technology, and an understanding of which pieces of the enormous potential machine are useful to your circumstances.

Not difficult

It is not because computers are difficult to use, though time is the essential ingredient in getting to know the capabilities of hardware and software. The QL was meant to be a getting-started machine which would grow with the user's knowledge, accumulated data and uses for the machine.

This is a more useful approach than the myth of the instant computer user. It allows for individual preferences and different spending power. It allows the computer to be integrated slowly into the work of an office. The QL is not just a replacement typewriter for an office secretary — it is a new way of working for the whole office team.

If you have been using a QL for home use and are considering using a



THE OFFICE REVOLUTION

computer in a business environment, stay with the machine you know. Much time is wasted moving from one machine to another and the same is true of software. If you have become familiar with Quill and adapted to its limitations, it is probably time-efficient to stay with it. If you are using the same computer at home and at work, you can work at home when you feel like it, taking advantage of inspiration when it strikes or finishing a report after dinner.

Working with the same computer and the same software avoids the time and problems involved in data transfer between 'foreign' machines. Spare sets of data can be kept at home, security and personal data ethics permitting, as a precaution against loss, damage or file corruption. If you are using a computer for business for the first time, obtain a copy of the Data Protection Act through your local bookshop, price £4.20, so that you know where you stand.

Productivity

To make the most of the productivity advantages of using a computer, make sure that all staff in the office have the opportunity to get to know the machine. The basic computer is cheap enough to buy a spare which can be used in emergencies and as a training machine for staff.

Computer courses are often unhelpful in making people comfortable and imaginative about using a computer in the office but if anyone is given a computer, a manual, and a few spare Microdrive cartridges, they can take it home, hook it to a TV set

and learn the basics of computer familiarity without anyone peering over their shoulders.

For the really integrated office team, the *QL Typing Tutor* (£12) will get everyone to a reasonable standard on the keyboard. It releases a good deal of waiting time, since individuals can deal with their own correspondence. A secretary can then be doing something more useful, like direct work with customers or research. In the old-fashioned office, work is done twice or three times by various people — the main problem is one of attitudes. There are still many people in business of all kinds who think that to use a computer keyboard is beneath them.

Efficiency

This article is based on my experience in introducing the QL into the office of a residential care home. As a small to medium-sized business, the care home is a good example of the kind of setting in which the QL can fulfil its potential as a practical working machine.

We started with a QL, a Quendata printer and Philips green screen monitor from Strong Computer Systems, which has continued to supply most of our requirements with admirable efficiency. We survived the first nine months of operation with an unexpanded QL, using it for letters, forms and information about our service.

There were many occasions when we were required to make alterations to forms or publicity material. Smart new copy could be generated without complete re-typing. This helped convince the doubters in the office that

the QL was a step forward and not an object to fear. The limited 128K memory was a restraining influence but at least we did not try to do everything at once on the computer and deter people.

We began building an Archive database of addresses of equipment suppliers, other agencies, committee members and volunteer helpers. It was not used much day to day because of the time needed to load Archive and the data — it was faster to use a pen — but it repaid efforts when it was time to send mailings to all our contacts such as an annual report.

Andrew Shepherd put his QL to work, and found that time and patience were the essential ingredients.

I wrote some simple procedures to scan and print the files, singly or in categories. By giving each address a field called 'category\$', we were able to select all our committee members and print the required address labels. Be prepared to edit procedures written for Archive to print labels. Every time we get rolls of labels they seem to be a different size, so it is necessary to add or take out 'print'" lines to make the roll move up by the correct amount.

Given a budget which gave target totals of expenditure in different areas — office expenses, food, building maintenance — I first used Abacus to keep track of outgoings month by month. It took several attempts to get the formulae correct in some cases. I found I had more success when I asked myself the question "What do I want it to do?" and then tried it, rather than looking for a similar example in the manual.

In most cases, I was making things unnecessarily complicated. Abacus was more user-friendly than I expected as a non-mathematician but one essential not likely to be guessed is the formula for rounding figures so that the total is the same as one obtained on an adding machine. Even when figures have been rounded in appearance, the contents of the cell are several decimal places.

The solution is to use the Int function, multiply your number or

formula by 100, add 0.5, and divide by 100. The result might look like:
 $\text{int}((G12) * 2.1286 * 100 + 0.5) / 100$

Although we are not a large-scale operation, the number of Quill document files expanded very quickly. A hard-backed exercise book was kept beside the computer as a manual directory back-up with a brief note indicating what was in the letter or document. That included a back-up column to encourage people to make a copy of all important documents. We discovered, like everyone else does, that all documents are important. A Microdrive cartridge with about 80 letters failed. Several of those letters would have been useful at a later date. We decided it was time to upgrade the memory and transfer to disc drives.

We bought a 512K Expanderam and dual disc drives — a considerable expenditure but one which quickly showed its worth. A few months later I bought a QL Trump Card expansion system and disc interface for a second QL. The expanded system allowed an entirely new level of usage and operation. Instead of being switched on and off for particular jobs during the day, the QL was now a full member of the office team, ready to use at touch of a key.

Although it may seem greedy, the extra memory allowed by Trump Card is worth the extra money when using multiple copies of Quill and Abacus. The full potential became clear when we started using the QRAM front-end system. It took some time to arrive at the correct mix of 'instant' copies of the Psion programs and free memory. The point is that if you have an enormous amount going into 'resident extensions' there is less space to have several programmes running.

Psion programs need to have memory space reserved for them in advance or they steal it all. The QRAM package explains how to do this but the suggested 32K reserve was not sufficient for our larger spreadsheets and documents; 64K serves most purposes, though we have a dedicated word processing software disc with a 256K Quill, a 64K Quill and the QTyp spelling checker. This means a large document can be worked on while other 'smaller' Quills, accessed by pressing 'Control C', contained rough notes, references or relevant data to be imported.

Data storage on discs is cheap and it is well worth transferring all data on to discs from Microdrives. This prevents complications with configurations. Psion software expects to use 'Mdv's', so the simplest way to use the software on disc is to insert 'Flp— use mdv' at the start of the boot

program. This makes everything work as if the disc drives were Microdrives — only faster, of course. It becomes confusing if you want to start using real 'Mdv's', especially when trying to print-out something, only to discover the printer instructions have not been read.

The expanded system allowed us to transfer all the manual accounting systems into Abacus spreadsheets. Even small jobs, like the petty cash account which requires frequent use and attention, could be done on the computer. Residents' rents, charges to the local authority and monthly returns were put on Abacus, one by one. We always ran the old paper system alongside the spreadsheet for three or four weeks while unforeseen problems were solved.

We make sure that every team member understands the spreadsheets and can enter data or look up information when required. Thus the chores are spread and work does not pile up at holiday periods. It also means that everyone can develop an understanding of the financial situation, which may or may not be a good thing depending on your point of view.

The monthly returns, which used to be an all-day job, are now done in one hour or so. Cash payments are entered throughout the month, divided across 20 expenditure categories. Cheque payments are entered across the same categories underneath. They generate two summaries of petty cash expenditure and total expenditure in an easy-to-read form, acceptable to the head office. The spreadsheet is large, so reminders are dotted about telling the user where to find totals, grid references for print instructions and how to clear data ready for the next month.

Having trusted the running of an office to a QL and its software, I have no doubts about the usefulness and reliability of the system. One QL had a tendency to crash when warm but this has been cured by the combination of an improved power supply from Adman Services and a Sandy Q-Power regulator. The developments of the last year or so, which have brought easy file management and multi-tasking through front-end software like QRAM, have transformed a basic workhorse into an exciting working environment, making full use of the designed-in compatibility of the Psion software.

The system has been completed by the purchase of a wandering terminal, the genuinely portable Z-88, another Sir Clive Sinclair innovation. Contrary to some expectations, the future works.

SOFTWARE FILE

Product: *DiscOVER*

Price: £29.50

Source: PDQL Computer Systems, Unit 1, Heaton House, Camden Street, Birmingham B1 3BZ. Tel (021) 200 2111

QL users with an interest in other computers may occasionally want to transfer files between systems with different disc storage formats. Typically, this situation occurs when a QL is used at home and the office machine is a PC or PC-compatible. This is made more likely by the fact that the Psion quartet of programs is available in PC-Four or XChange forms for PCs. The claimed sales figures for both forms exceeded the total sales of QLs.

In the office, there must be some places where PC and Thor are used. The point of contact is, perhaps, most likely to be text output from a word processing program but it is by no means unlikely that spreadsheet and database files need to be ported across between machines.

Direct connection between the serial ports is one way of transferring data but it may not be practicable because the computers are too far apart. It can also be rather a frustrating process, taking much time and knowledge which the business user lacks. *DiscOVER* provides a much cleaner way of passing files to and fro. It operates on 5.25in. or 3.5 in. standard discs and can transfer files from Alien disc format into Host QL format or vice-versa.

Alien at present means primarily IBM, although Apricot discs can also be handled; future releases

will cover CP/M, BBC and Atari format discs and possibly others if there is demand. It is hoped to make plug-in modules for each format, so that users can add the extra capability without having to buy the complete program again.

Before commenting on the program, it should be made clear on which machines it can be used. All QL versions, the Thor I and the Thor XVI are suitable. The types of disc which can be handled are at present restricted to IBM format 180K and 360K 5.25in. and 720K 3.5in. and Apricot format 315K and 630K 3.5in. High-density 1.44MB and 1.2MB discs cannot be handled, because the interfaces used on the QL cannot cope with them.

You cannot be absolutely sure of compatibility

ATs. Normally it is possible to format discs in these drives to capacities lower than standard — 1.2MB drives can format to 360K and 1.44MB drives can format to 720K. Whether or not discs produced in this way can be read on drives which are not of the high-density type is something only tests will show — this applies to transfer between PCs, not only to PC-QL transfer.

The general advice is that 3.5in. discs of 720K can be transferred safely between standard and high-density drives, but 5.25in. discs of 360K should be transferred only between standard and high-density drives if any write operations are done on the machine in which the discs were formatted. That is, 360K discs should be formatted and written to

interface is likely to be unsatisfactory. A use which may not have been intended for *DiscOVER* is the conversion of files on 5.25in. discs to 3.5in. The majority of PC users have 5.25in. discs, often hundreds of them, and they will be unhappy when upgrading to an AT or PS/2 machine because IBM has finally decided to give its seal of approval to 3.5in. drives and is now standardising on them.

New drives

For all the stocks of files and programs off the old PCs to be usable, they have to be transferred to 3.5in. and buying 3.5in. drive to do this is expensive. If there is a QL handy with 3.5in. drive, *DiscOVER* can be used to to the job; 5.25in. drive can be borrowed from a PC and fitted temporarily to the QL, provided you know enough about the required connections and drive number setting; drives are surprisingly compatible.

The IBM-format files on 5.25in. disc are first converted to QL-format on 3.5 in.; then they are transferred to IBM-format 3.5in. formatted in PS/2 or AT. If there is only one 3.5in. drive available there must be an intermediate stage, copying to QL-format 5.25in. This may sound long-winded but it is a fast operation, because *DiscOVER* does the job speedily.

The review version of *DiscOVER* was 1.15 on a 720K 3.5in. disc. The host machine was a JM QL fitted with a Trump Card. The alien machine used was an Opus PC V, a PC/AT-compatible, with 3.5in. drive, switchable between 1.44MB and 720K. It is surprising that this drive has to be switched over manually to

Bryan Davies tries out a new software package from PDGL which allows you to transfer files between different disc systems, including PCs.

between different types of drive and disc but PDQL provides a compatibility table to give guidance on the subject. Normal QL 40-track double-sided drives can read from and write to 40-track discs from single-sided or double-sided drives; likewise, 80-track double-sided drives can read from and write to 80-track discs from single-sided or double-sided drives. Beyond that, there is read-only compatibility with some other types of drive.

While no errors may be indicated, some combinations are unsuitable. One problem area which has become important in the last year or two concerns high-density drives on PC

in 360K drives; they can then be read reliably in 1.2MB drives but, if they were written to by them, they may not be readable back in the 360K drives.

Having said that, I have transferred a considerable number of files on 360K discs between an Opus PC III with a 360K drive and an Opus PC V with a 1.2MB drive and am not aware of any errors having occurred; most, but not all, the discs were formatted to 360K in the 1.2MB drive. A final point on compatibility concerns the QL interface; all the well-known types should be suitable but older Micro Peripherals interfaces need to have the updated ROM fitted, from QJump or Care. The MCS

read the different density discs, whereas the 1.2MB/360K 5.25in. drive fitted to the same machine switches itself automatically. That led to an apparent problem; when attempting to read a 720K disc with the drive set to 1.44MB, reading was successful for a time, then errors started occurring, leading to lock-up of the AT. Be warned and make sure your AT is configured to read and write 720K discs if the drive is high-density.

The instructions for use are in the standard Quill — doc file form on the single disc; they occupy about eight pages. It is possible to use the program without reference to the notes but they make good background reading and are essential for dealing automatically with conversion of special codes. PDQL states that DiscOVER has been checked for multi-tasking under QRam and TaskMaster and should not give trouble with other front-end programs; the review copy worked successfully with Q-Switch.

Simple

Conversion of text files from IBM to QL format was simple, following the menu instructions; the copying took a similar time to a normal QL copy. Several files could be tagged and copied consecutively, leaving the user free to do other things. Directories and sub-directories are catered for. Host and alien files can be viewed in a large window, making it fairly easy to spot what might be causing a problem loading a converted file.

Making a two-way check on the accuracy of copying was simple and speedy; text files from PC word processing programs — Quill 1.1, DisplayWrite 4, WordStar 3.3 and Multimate Advantage 3.60, were transferred to QL format, then back again to PC format. Loading them back into the programs with which they were generated showed them to be, as far as could be seen,

identical to the originals. One small irritation was that copying continued long after the target disc became full; no “disc full” warning is given.

Once PC text files have been converted to QL format you have to decide which program(s) to use for processing them. The obvious answer is the standard, read-anything program, *The Editor*. All the files checked loading successfully into Editor and could then be manipulated as required. This can be a

“A converted Quill from the PC to a QL-format file. . . It is interesting that it is more than twice the size of the QL version, without many extra features.”

lengthy process, as some word processing programs insert many non-printing codes into documents.

If files from a particular program are to be converted on a regular basis it would be worthwhile taking advantage of the Translation Table facility offered by DiscOVER. It permits a list of code conversions to be supplied to the program, so that it can replace the PC codes automatically by ones appropriate to the QL program which will be receiving the files. This is no different from what has to be done if QL Quill files are read into Editor. For those unfamiliar with such codes, life is made easier if the PC and QL can be run side by side, with the same file on-screen on both systems; the significance of the codes is then fairly obvious.

PC Quill files have a similar header to QL Quill ones — the “vrmiqdf0” is used although the proceeding and succeeding characters differ. Neither the Load nor the Import function will bring up the converted files on the QL screen. Neither does modifying the file header to look like the standard QL Quill version make loading of the files possible. You have to produce .exp files with the PC Quill Export function; QL Quill version 2.36 has

this function but I have not been able to obtain it.

Converting these files to —exp form, which DiscOVER does automatically, makes it possible to import QL Quill. Abacus —aba files likewise would not load the QL but —exp files would. Note that Abacus files lose any embedded formulae when they are exported; you get the data in the same layout but have to re-enter the formulae if re-calculation is intended.

It would assist many

users if the instructions were to deal with this aspect of the transfer process; at present, no comment is made about how to load transferred files into the receiving programs. The reverse procedure — writing to the same transferred files on the QL and then converting them and reading them on the PC — was also successful, provided the Import/Export functions were used.

With QL Quill it is necessary to use the Print function to produce files for export in the —lis form; if you use much in the way of translations in your printer driver, remove the disc/cartridge with the printer —dat file on before using

problems I had moving Psion data files to and fro all appeared to be related to the programs, particularly to the Export, Import and Print functions, and could not be blamed upon DiscOVER.

Where the office program on the QL, unless the user has WordStar on similar running with one of the CP/M emulation programs. Text files from various PC word processing programs were read successfully by Editor after conversion by DiscOVER. To make such files fully readable, with the PC codes replaced by suitable Editor ones, is essentially the same job as with Quill files. It is necessary to be careful when deciding which parts of the text are kept and which deleted.

Beware

The way in which WP programs handle deletions varies and you can be fooled into thinking text is a valid part of a converted file when it is just “stored” deletions. QL Quill accumulates deleted text at the end of —doc files; Multimate collects deletions in various places, even to the extent of splitting good words and inserting deletions between the halves. Files from WordStar 3.3 had the last character of every word changed to a control code — e.g., 244, which is the code produced by F4 — and an extensive Translation

INFORMATION

MP ROM:
QJump,
24 King Street,
Rampton,
Cams CB4 4QD.
Tel: 0954 50800

Care Electronics,
800 St Albans Road,
Garston,
Watford,
Herts WD2 6NL
Tel: 0923 672102

the Print function — the —lis file may have only part of the —doc file otherwise.

The Print function is not always completely successful, as some codes appear to prevent saving of a —lis file; the @ (“at”) character prevented following text being saved on one file and had to be removed. The occasional

Table would be needed for regular conversions but the basic layout was more or less as the original, as it was with WordPerfect 4.2, and there was no need for general reformatting.

Straight DisplayWrite 4 files emerge in a form most non-programming users would refer to as garbage but they can be changed to

a usable form by taking the Print option DW4 and writing to disc. When converted by DiscOVER, they are then similar to a Quill —lis file. From the point of view of saving time re-formatting the text, it is possibly advisable to put files into an "export" form from within the originating programs; most PC WP programs have an option to produce ASCII-form files.

Source-code program files — programs written in Basic or C language — can be converted. Some programmers prefer the QL to other machines for program development and DiscOVER gives the freedom to do the work on the machine best-suited to it. If your PC compiler is faster, transfer the files back to IBM-format for compilation. Object-code program files can also be transferred but they are unlikely to be of much use to most people when converted. To see what happens, I converted Quill from

the PC to a QL-format file and loaded it into Editor with no problem. I am not competent to comment on the resulting code but the error messages looked sensible.

Larger

It is interesting to note that the file is more than twice the size of the QL version, without containing many extra features. At first sight it may look rather more difficult to transfer files to the PC. Will files from Quill or Editor be readable by such as WordPerfect or Multimate, or will it be necessary to use an editing program? The editor supplied with MS-DOS is poor and not something you want to use if there is a choice. Quill files which have been Printed to —lis files, then converted by DiscOVER, can be Imported by PC Quill without difficulty. Perhaps it is surprising that Editor files also can be read into the PC Quill, provided they

are given a —exp extension for conversion by DiscOVER. What is more, there is little to do to the files after they have been Imported into Quill, as Editor does not sprinkle its files with codes. The same Editor files could be loaded by WordPerfect.

All in all, DiscOVER works very smoothly and is straightforward. Swapping files between PC and QL created no headaches, which makes a pleasant change from much of the experimenting one does with software. Above all, it did not take much time, which must be an important factor for business users. The hard work is in changing codes to suit the program in use and that process can be eased considerably by using the provided Translation Table feature.

The program occupies about 80K of memory when loaded and caused no trouble when run simultaneously with Q-Switch,

Flashback, Quill, Abacus and Editor on the JM QL. It converts in both directions quickly and with no fuss and does not appear to introduce errors into the converted files. Being contemplated as future enhancements to DiscOVER are parameter files to enable special codes to be retained during the conversion process.

Lost codes

The print codes produced by Quill for Bold, Italic and so on are lost at present, and it is not easy to write a translation program to put them back in; Translation Tables allow straight conversions of codes but they do not allow for the situation where the same code is used to switch on and switch off a function, as is the case for Bold, Superscript and the like. It would also be helpful if the formulae could be retained during the conversion of Abacus files.

THE PERFECT PRESENT FOR ANY QL — OR EVEN ITS OWNER

SCHÖN

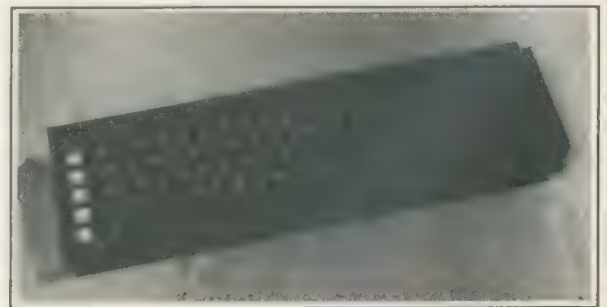
KEYBOARDS



SCHON PC KEYBOARD: This product has been acclaimed as "the best QL add-on for a long time." As shown above, the Schon PC Keyboard is supplied with a housing to cover the QL circuitry. Expansion port and M drives are still accessible. The keyboard interface simply plugs into the 8049 co-processor socket. The keyboard itself has 86 full travel keys and include single key left and right delete, illuminated caps and NUM lock, two enter keys, diagonal cursor keys. This product will certainly change your approach to the QL and is guaranteed to benefit you. Full spec sheet available on request.

SCHON NORTHCOTE CRESCENT, WEST HORSLEY, SURREY KT24 6LX (04865) 3836

Please allow 28 days for delivery. Trade enquiries welcome



SCHON STANDARD REPLACEMENT: The most widely sold replacement keyboard for the QL is the basic add-on keyboard. It makes no drastic changes to the QL other than the keys. Expansion port, rear ports and M drives remain unaffected. The 65 keys are all full travel and have two shot plastic symbols. To install — simple screwdriver job, no soldering — 5 minutes. Spec sheet available.

Please send me the following:

- Schon PC Keyboard @ £99.95 inc VAT. £2.50 p&p.
- Schon Standard QL Keyboard @ £54.95 inc VAT. £1.70 p&p.
- PVC Dustcover for PC Keyboard @ £4.95 inc VAT.

Mr Mrs Miss _____

Address _____

P. Code _____

Amount enclosed _____

Overseas: Deduct 15% VAT and add £4.00 for Standard Keyboard, £8.00 for PC Keyboard. U.S.A., U.A.E. & Australia, etc., add extra £12.00 for air mail.

TECHNICAL HELPLINE

Paul Walton tracks down the elusive Dixons 8056 printer roll, Associates with Archive and gives a Newbury a terminal diagnosis.

Dixons roll

Bryan Davies has received a number of queries concerning thermal paper for Dixons Serial 8056 printer.

Dixons must have sold a fair number of QLs with the 8056 printer included, as we receive regular requests for information on obtaining the roll paper for it. The latest letter also included a complaint about the quality of paper obtained from a local Dixons shop in recent times. The samples supplied certainly indicated the print was appreciably less dark on the more recent paper.

Dixons central customer service department has responded helpfully each time I have contacted it and the latest comments from there are to the effect that there have been no other complaints about poor print quality and the paper is still obtainable from its shops. As shops are likely to have to place a special order to get the paper the address of Dixons mail order department has been supplied. Regarding quality, the nature of thermal paper, I think, makes it liable to deterioration with time — possibly with exposure to light also. A sample roll was supplied by Dixons and it has been sent to the reader who made the complaint, for him to test and make comments. We will let readers know what he says.

There are fewer questions now about setting up the printer for use with Quill but how about sending your printer driver settings, so that they can be made available to readers who are still having difficulty? If you send anything,

please provide a list with both the keys used and the equivalent codes needed for the printer, that is, the entries as they are put into the Quill printer driver table, including the Translate entries. Those using *Editor* should supply the equivalent list for whichever version of the driver is used — indicate which please.

Contact Dixons Ltd, Mail Order Dept, Camera House, Cartwright Road, Stevenage, Herts. SG1 4QD. Tel: 0438 314371.

Terminal input?

B. Fletcher of Falkirk writes: Is it possible to connect the QL to an old Newbury terminal along the RS232 link and expect them to talk? Could I get the terminal to show the QL screen output and use the terminal keyboard for input, with Archive for example?

The old Newbury terminals use the original technique of connecting the keyboard/screen to the computer through an RS232 link. The link transfers ASCII codes and the terminal contains the hardware which converts keypresses to ASCII and ASCII to characters on the screen.

This arrangement is not very compatible with a machine like the QL which has the keyboard wired internally to an input processor and outputs UHF/VIDEO to its screen device. Apart from the challenge of making it work, I cannot see much advantage. Nevertheless, the serial link could be used with little difficulty to join the two; the problem is how you make programs use this as their input/output device.

At first sight, it may seem to be a case of closing the existing channels #0, #1 and #2 and so on, re-opening them, say, as ser1. With channel #0 this close/open process would need to be done in a program, as once you close channel #0 you cannot give any more direct commands to the QL.

It is difficult to see how you could use the RS232 link with complete transparency to existing programs. There would be a particular problem with machine code programs which usually set up their channel allocations when they start. This would overwrite your attempt to direct output to ser1.

The Psion programs set up their channels and windows in the boot file which starts them. This may seem to suggest that, by modifying the boot file, they can be made to work. Unfortunately, the programs have output which uses a good deal of screen positioning and formatting. They are unlikely to work well on the Newbury to the extent of making the screen output unreadable.

Quartet club

M. Mann of Polegate writes: I have a Sinclair QL 128K and wish to index more than 1,000 members of an association with the fields Title, Initials, Surname, Section number, Street, Town, County, Postcode and Telephone number. Is the memory of my computer sufficient and do I need any software other than the 2.3 version Psion programs?

The memory of the QL is not really the issue. The limiting factors are the number of records in an

Archive database file and the capacity of the Microdrives.

The maximum number of records — all the fields described form one record per member — depends largely on whether you want to order the database on one or more fields. With ordering on only one field you can have up to 2,300 records. This falls to 1,450 and 1,070 with ordering on two or three fields.

Your biggest problem will probably be the capacity of the storage medium. If you have a 720K disc system all is well but if you are using Microdrives the total size of the database file is limited to about 100K.

Splitting the database into separate files might overcome this problem but then you lose many of the advantages of Archive, ordering, searching, selective printing.

Fortunately Archive uses variable-length records. This means that if two members' names are Smith and Smitheringale it allocates five and 13 bytes respectively; fixed-length records would have to be 13 bytes long. Nevertheless, simple arithmetic tells you that the average length of a record must be 100 bytes, i.e., characters, if you are to fit 1,000 records on a Microdrive cartridge.

As an experiment I created a database file with the fields mentioned. I then filled it with 1,000 records with field lengths 4, 4, 14, 4, 14, 14, 14, 8 and 14 respectively, a total field length of 90 characters. It occupied 205 sectors on a Microdrive.

So the answer is that you can use Archive but you will need to watch the membership size and avoid lengthy records. Something like *Archive Database Analyser* from PDQL may be a worthwhile investment

IDIS The Intelligent Disassembler



Ron Massey reviews a disassembler which helps programmers get to grips with machine code.

Product: IDIS **Price:** £24.95
Source: Digital Precision, 222 The Avenue, London E4 9SE. Tel.: 01 527 5493.

The most probable reason why many budding programming enthusiasts fail to get to grips with low-level programming languages, such as assembler, is that there is a serious shortage of useful tools and books available to the novice programmer on a subject which can be very heavy going.

All computer languages are interfaces between user and machine; some languages have been developed with a bias towards particular specialisations such as science, business or graphics.

Languages as programming interfaces can occur at any of several levels but whatever language is employed by the user, the computer understands only one — binary.

Basic is the first language most new users meet. The SuperBasic lack of speed, however, is largely due to the QL internal conversion from the Basic source code to binary code.

When compiled with Digital Precision *Turbo*, programs run as fast as is possible using Basic as the source code.

Other programming languages have their own features to commend them but, if you are interested primarily in maximum speed, the only language to use is assembler, a system which employs instructions, called mnemonics — similar to acronyms — for programming.

Assembler source code consists of lines consisting of a label, a mnemonic instruction and an argument; in common with Basic, you can include comment lines. Once the source code has been compiled, converting the program to machine code, there are a number of reasons why a disassembler, which reverses the process, may be necessary. The most obvious is the loss of source code caused by media corruption or an inquisitive pet. Disassembled listings enable you to analyse how a program works. You can also use disassemblers to adapt other writers' code to your programs.

One of the main problems with standard disassemblers is that a considerable amount of related work

is required before you acquire a sensible source code listing.

The newest addition to the Digital Precision stable of programs is the *IDIS* system for the intelligent disassembly of machine code.

In addition to including the best features of standard disassemblers, *IDIS* discriminates automatically between PROGRAM and DATA wherever possible — and, for *IDIS*, much is possible. The important point is that, unlike SuperBasic, machine code has no special identifier for DATA.

On starting, you have four options:
A for ASCII — a memory dump.
D for a normal disassembly.
I for an intelligent disassembly.
Q for Quit.

While in the process of disassembling a file, *IDIS* carries-out automatic behind-the-scenes exploratory disassembling and examinations to check the likelihood that the contents of a particular set of locations are code rather than DATA. Results from these scouting trips are not produced as output.

In cases where *IDIS* fails to differentiate between code and DATA, you are prompted Code, Data or Quit. If you guess incorrectly, *IDIS* will proceed as far as it can and then stop; you can resume disassembly with the correct guess.

IDIS-produced labelled files are ideal for subsequent optimising in which you can edit and re-organise the source listing. For example, .L branches or jumps can be replaced by .S ones.

You can also vary proximity and move code groups round safely, which would not be simple if all you had to work with was explicit address references, as is the case with standard disassemblers.

Three passes

Disassembling with *IDIS* may occur in up to three passes; *IDIS* stops when the top level RTS — return from subroutine — is reached. If output is to the screen, only the first pass is offered.

Pass one produces code suitable for study but not for re-assembly. Code produced from this pass could be reassembled only to the address from which the program was disassembled, as there are no labels.

Typically, *IDIS* disassemblies follow this course:

PASS 1: Irrelevant parts of the program are excluded automatically and the various parts including sub-routines are not sorted in any particular order.

In hexadecimal terms, DE88 means PEEK(003662) = (DE); PEEK(003543) = (88).

If you opt to send the output to a

storage device you are offered the choice of pass two and an optional third pass to produce a labelled disassembly file.

The second pass produces an unlabelled *-tmp* file, unsuitable for re-assembly except to the same address but which contains the blocks in logical sequence. Also, multiple references are automatically filtered out.

For example, if address 0F03C was called at one stage and, later, a part of it — say from 0F03E — was also called, pass one would have shown the block twice. IDIS excludes automatically irrelevant parts of a program, cutting out the 'noise'.
PASS 2

Merged

Two or more *tmp* files can be merged at the end of this pass. In pass 3, all addresses are replaced by labels consisting of three characters of your choice, followed by 000-999 generated by IDIS. You can then modify and/or re-assemble and produce ready-to-run code to any address of your choosing, or even to address-independent code. You can also substitute more meaningful label names and add comments using any editor.
PASS 3

```
* Start address . . . 02C194
* Start label . . . . LAB000
02C194 TST.B D1
02C196 BEQ.S $02C19C
02C198 BSR.S $02C1A2
02C19A BRA.S $02C19E
02C19C BSR.S $02C1C6
02C19E MOVEQ #000,D0
02C1A0 RTS
02C1A2 LEA $02C1DA(PC),A3
```

```
* Code disassembled with IDIS
* (C) by PL 1988
```

```
LAB000 TST.B D1
      BEQ.S LAB001
      BSR.S LAB002
      BRA.S LAB003
LAB001 BSR.S LAB006
```

```
LAB003 MOVEQ #000,D0
      RTS
```

```
LAB002 LEA      LAB004,A3
      MOVEA.L $0000(A3),A0
      MOVEA.L $0004(A3),A2
```

IDIS automatically includes sub-routines and calls, even a great distance away in the program, except those which are not referenced explicitly. The ratio of assembler

source code to compiled machine code is in the region of 10:1.

A typical example of the latter could be an instruction JSR (a5). This is a mnemonic instruction to jump to subroutine. Perhaps a% is set to a value on an immediately previous line and there is no way for program control to enter the routine between that line and the JSR (a5) instruction.

Vectors

Even though it may be possible to know the value of a5, it is also possible that the value of (a5) — to what it points — is unknown at run-time. There is no great difficulty as these are almost certainly calls to QL ROM traps using vectors. Otherwise they are the result of very poor programming — a little like using GOTO PEEK—W(x).

The highlighting of ROM calls — as used in the JSR (a5) example — is also useful because it is precisely these — and often nothing else — which would need to be re-directed if you were moving the code to another computer.

The IDIS system includes two independent machine code utilities which, although they are intended to be used with IDIS, can be used separately.

Which is an information utility which will print to the screen — or a file — all machine code functions and procedures present in the QL, along with their start addresses. If you wish to modify existing keywords you can even disassemble any of the QL extensions, both native and add-on. Using the *Which* utility finds their address. ROM-based extensions are always at fixed addresses; add-on extensions are more mobile.

Using this utility, you can disassemble individual keywords — QL native or add-ons — or virtually anything in the QL memory but there is one point which should be considered; it is not uncommon for one procedure or function to 'use' another procedure or function. This is no problem, as IDIS will always include all the code fragments which are relevant and/or needed.

The second utility, a function called *ISIT*, will tell you whether or not a particular extension is available. With *ISIT* into your boot program, you can test for the presence of toolkits such as *QLOAD* or *Lightning* by modifying your media boot in the following manner:

```
1 a = RESPR(512) : LBYTES drive—
  ISIT,a : CALL a : PAUSE 50
2 IF NOT ISIT("—lngNOMODE")
3 b = RESPR(21758) : LBYTES drive
```

```
—lng—TEXT—ext,b
```

```
4 CALL b : PAUSE 50
```

```
5 END IF
```

```
6 REMark ** Put remainder of boot
  program from this
```

```
7 REMark ** line downwards
```

```
8 . . . . .
```

Alternatively, you can organise automatic toolkit loading by putting each toolkit into individual procedures which are called only if they are not already available.

Using *ISIT* in this manner prevents multiple invocation of toolkit extensions. As a function, *ISIT* returns a logical one, if the extension — procedure or function — is available and a logical zero if it is not.

Digital Precision has ensured that IDIS is totally compatible with all documented instructions from the range of Motorola 68000 processors. A few of the undocumented instructions used in questionable programming techniques are also supported, such as some of the *BTTST* variants.

Valuable

My feelings about IDIS as a system fall on three levels. As a programmers' tool, IDIS is valuable. Conventional disassemblers cannot produce easily-modifiable code from machine code. What may not be readily apparent is that IDIS can disassemble all machine code, whatever the original language used to produce it.

Second, if you are interested in seeing how source code is constructed for the purpose of learning machine code, you could scarcely do better than use IDIS for the purpose.

The third point about IDIS is that the function *ISIT* is a useful tool in its pwn right. If you use a range of toolkits for different purposes, and/or boot a succession of discs without resetting your QL each time, loading the same toolkit successively is not recommended.

IDIS can be multi-tasked, even with itself.

Readers wishing to study assembly programming may care to consider examining the following books:

Advanced Machine Code Programming by Adam Denning, Duckworth.

QL Advanced User Guide by Adrian Dickens, Adder.

The Sinclair QDOS Companion by Andrew Pennell, Sunshine.

QL Technical Guide by Tony Tebby, QJump.

68000 Assembly Language Programming by Kane, Hawkins and Leventhal, McGraw-Hill.

Anyone who knows me will tell you I am a busy programmer and very untidy. When I program I have pieces of paper all over my desk, with notes on them about the program on which I am working. I expect that a few people have the same traits when trying to keep track of things.

What can you do about it? One suggestion is a program called *Notebook*. It lays in memory while you do other things on the computer but comes to life when you press the ALT and SHIFT keys together. I ran *Notebook* with programs written in Basic and machine code and compiled programs and, in every case, *Notebook* laid satisfactorily in memory and worked well when called up. It is what it says, a notebook for making notes and it could be useful for anyone who uses a QL.

I write the documentation for all my programs using a second computer on-line for word processing. Using *Notebook* I can run a program and move in

Program: Notebook
Supplier: ILD Datasystems, 13 Lon Ysgubor, Rhiwbina, Cardiff, CF4 6SF.
Price: £19.99

Notebook when I want to make a few notes and save them to use later. It tidies my workbench and gives me notes in a clear text which I can read.

My QL has a Miracle Systems Centronics printer interface and Trump Card attached and it is on this QL that I ran *Notebook*. In the copy I received to review I noticed two errors.

Error one was on the initial start-up at the bottom of the screen and informed me that *Notebook* AOO Installed, which I think should have read *Notebook* AOO Installed — a slip of the programmer's key but it is no serious error.

Error two was on the help page which says Shift Esc Exit to main menu. It should have been Ctrl Esc

SOFTFILE

I Shirley Peters tests a new program which turns the QL into personal organiser, and finds that its claims are (almost) fully justified.

Exit to main menu. Both errors have probably been found by the programmer who wrote *Notebook* and corrected by now.

Notebook is packaged neatly in a plastic folder. The accompanying manual is neat and well-laid-out and easy to read and understand. The Editor module can be used with little or no reference to the documentation. I needed, however, to refer to the manual for the House-keeping module.

Like any other program *Notebook* takes a little time to get to know. Once you have made friends with it, it is easy to use but no matter how easy a program is to use, I always believe that the documentation should be read fully to get the best from it.

Notebook can be installed in two ways. It can be loaded using the standard boot or by the direct typed-in command EXEC mdvi—*Notebook*—exe.

Once it is loaded it will then load its date file automatically and it is in this file all the notes you make are stored.

I used the standard boot for installation, after which I pressed both ALT and SHIFT. *Notebook* came to

life and presented me with a smart, efficient menu of the modules available for use. I had four options offered — Editor, On-Off Alarms, *Notebook* House-keeping and Character Set. Selection of the options was made by moving a bar from option to option using the cursor keys. Selection was completed by pressing SPACE or ENTER. The Editor module is an editor-type program which allows you to enter up to 100 lines of text with a maximum of 126 characters to a line. If you type more characters to a line than can be displayed as a line by the screen the text is scrolled off the left-hand side as you type. This means that the whole of the line of text cannot be seen at once and the cursor keys must be moved along it to bring the hidden parts into view.

You can move easily to the start or end of a line or along it character by character or word by word. When you reach the end of a line the cursor goes to the next automatically. There is no word wrap function and no indication when you are at the end of a line and I found it easy to lose a character if a word spilled from one line to the next.

Blocks of text can be marked to be copied, deleted, inserted or dumped to printer. With my Miracle Systems Centronics printer interface and Brother M-1009 dot matrix printer I had no problems with the printer facility.

Marking blocks of text seems to warrant marking the first character of the start of the block using Ctrl + s and marking the last character of the end of the block with Ctrl + e for it to be manipulated by other commands which require marked blocks on which to work.

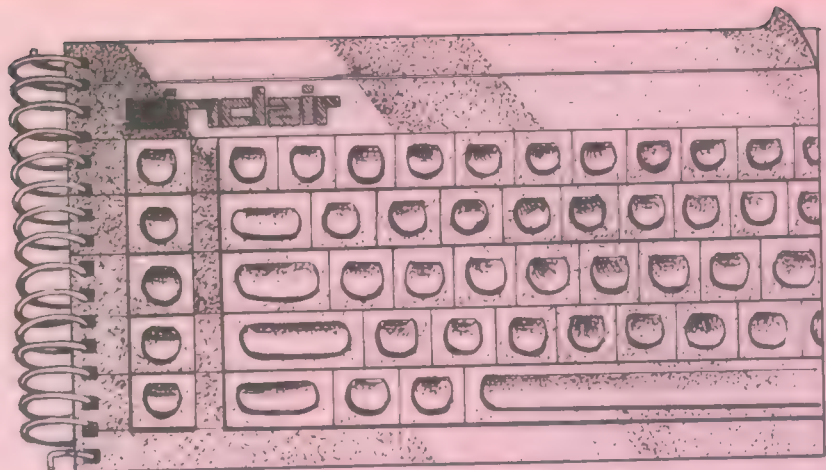
There are a number of commands on the Editor module which are found on most word processor and editor programs. In all I counted 25 commands available.

Help page

Facilities to find occurrences and next occurrences of strings, fast positioning of the cursor at the top or bottom of text, case changing under the cursor and so on were included.

A help page exists on key F1 for reference to the Editor commands. Some commands are available after pressing F3 and a few of them needed confirmation with Y or N before they were executed and are explained in the manual which accompanies the program.

The *Notebook* House-keeping module allows you to change parameters used by *Notebook*. Selection of the options therein uses a highlight bar moved by the up and down cursor keys. New filenames are made



with the keyboard and parameters are toggled using cursor keys. A customised version of Notebook can be made and you can change the name of the file Notebook uses to store its data blocks.

Alterations

Ser1 of ser2 can be selected for output to a printer and carriage return, with or without line feed, can be set. Baud rates can be altered, as can the time-out and the system clock. Suitable modules can be linked into the Notebook system by supplying a filename. If the modules linked in are unsuitable they can cause the system to crash.

Any modules, apart from Editor, Alarms or Housekeeping, can be unlinked from the Notebook system. Unused date blocks can also be unlinked and care should be used when unlinking these blocks because you could lose data you do not wish to lose if

you made a mistake or did not know what you were doing.

There is also a section on writing machine code modules to link into Notebook. It is complete with the data on the vectors to use to assist in programming, which is useful if you program in machine code. Character Set module displays the full character set from character 0 to 255 in pages of 16, using the up and down cursor keys. The character number, keying to get the character, and the character displayed or the function the keying produces is shown.

It is the only module which, can be unlinked from the Notebook system, as it holds a large amount of data. The On-Off Alarms module gives you 12 alarms which, can be set with the date and time and a comment which is displayed when the alarm is triggered.

I find that my programming sessions become

rather involved and I lose track of time. This function I found useful, to remind me of something I had to do at a certain time or a program on television I wanted to see.

The alarms do not trigger when using Notebook, as the program runs in supervisor mode. When the alarms trigger they sound for about a minute and display the comment you have specified when setting the alarm.

Automatic

Saving the notes and data is automatic when you press ESC to leave the modules. Error-trapping is included and works well and gives you the option to re-try or cancel. If you leave a module by pressing ESC you are returned on your next entry to Notebook to the point where you exited.

Notebook times-out after a time if it has been called and is not being used. The time-out is set to five minutes but can be changed

using the Housekeeping module.

When timing-out, Notebook updates its datafile of your notes and exits and goes to sleep until you call it again. My final view of Notebook is that a thorough reading of the manual is necessary for the user to become acquainted with it and that does not take too long.

I would like to have seen a justify function in the Editor as it would have made it more pleasant to use and the printer hard copies produced neater. It is an editor and not a word processor.

Perhaps a character counter would be useful, to tell you how many characters, including spaces, you have typed into a line, or an audible warning when the end of a line was reached would have been helpful. All in all, though, it is a friendly, menu-driven program, easy to use, neatly laid out and attractive and one I shall use.

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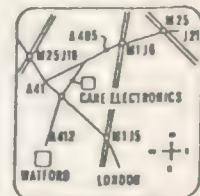
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T**R O U B L E****A****P****R****O****B****L**

Bryan Davies counts the cost, in time and money, of expanding your QL system.

Many QL lovers must have been encouraged to see so many people at the get-together at Aston University. An estimated 150 listened to several of the best-known figures in our small world and my impression was that the affair was a success. For those who were able to relate their problems directly to experienced programmers there can be no doubt that five minutes' person-to-person discussion is worth almost any amount of reading books.

One demonstration by Chas Dillon typified the kind of thing which could save the average user hours of agony — how to set up the Quill printer driver to make your printer talk, the ways which can be used to enter codes; the little tips like adding spaces to code combinations to avoid lines looking the incorrect length when printed; the ways of getting particular characters, e.g., the £, to print. These tasks seem difficult to many users. A show of hands suggested that a large proportion of the audience during question time had more than one QL and a few had other machines such as the Amiga. The answering panel made it clear they did not regard Amstrad, Atari or Commodore machines being as in any way upgrades from the QL.

Some readers say they are contemplating upgrading to a PC-compatible computer. I have bought a PC/AT-compatible but the reasons were purely commercial — it might be possible to make money using a PC — and nothing to do with upgrading. It would have to be a good compatible to offer what the QL does, in computing terms, and I expect to do only straightforward paying jobs on the PC, staying with the QL by choice most of the time.

There are areas in which the QL does not perform well enough to satisfy some users and having a hard disc driver certainly makes the AT look very much faster than the QL when files are saved or loaded. Despite the ability to multi-task being a basic part of the QL structure, it seems unlikely that many users make much use of the feature; most

would be content to be able to swap programs in and out quickly and that can be done on the AT because the hard disc is fast enough to permit it.

Hard disc may be available on the QL this year, although at a price much higher than for PC-type machines; the big rise in chip prices early in the year will not make it easy to sell units involving memory at attractive prices and there is the danger that few users will want to pay as much for a hard disc as for a complete computer system — e.g., Amstrad or Atari.

Anyone seriously contemplating a move to a PC should look at the costs — money and time — carefully. Software costs much more than the equivalent items for the QL, without necessarily being any better for the job, and there is an immense amount of reading to do to get to grips with operating systems and programs. Having examined the word processors *WordStar*, *DisplayWrite 4*, *Multimate* and *VolksWriter de Luxe*, I think Psion Quill is far easier to use and just as good for most people's purposes.

Savings

What you save in buying a discount-priced QL and software can often be spent quickly buying small items of hardware. Connectors and leads are particularly expensive, as are interference suppression devices. If you need such things as D connectors, varistors, contact cleaners, try Electrovalue. It supplies to non-account buyers and accepts Access card payment.

Setting-up a printer is a subject which could outlast TV soap operas. Most readers who write with printing problems are still using Quill, which may not be the best thing to do these days, and they are failing to come to terms with the Quill printer driver mechanism and the printer manual. Quill 2.35 can support most of the typeface features you are likely to need and get from a standard printer. It is a question of reading the instructions in the information section of the QL User Guide thoroughly and experimenting with the embedded typeface and Translate entries when running the Install-bas program.

The entries for the embedded functions — Bold, Underline, Superscript and Subscript — can be used for other features, if the appropriate printer codes are substituted for the standard ones. Many users will not need either

Superscript or Subscript normally and could insert, say, condensed and italic print in place of them. The Translate entries allow 10 more printer functions to be called. Some entries may be needed for obtaining characters which do not normally print without assistance, e.g., the £ sign, but there should be sufficient left for enlarged print; medium size — enlarged combined with condensed; Elite font — 12 characters per inch — and so on.

Whatever the printer manual says, note what the QL book says about entering codes; ESC "M" or ESC,M may be what the printer manufacturer says for obtaining Elite font but the Quill driver wants to see ESC,"M — alternatively, type-in 27,77. The ESC should be typed-in as it looks — do not hit the ESC key. There is no point battling with the printer driver if you have not followed the printer instructions concerning setting any DIP switches on the printer.

If somehow you cannot find a £ sign in your printouts and there is no U.K. character set in the printer — unlikely — consider using the basic U.S. character set and turning on from the printer driver an additional "special" set of characters. The Kaga Taxan/Canon printers have a Control Code Section feature — ESC "I" + n — which has the £ sign under the code 6 (decimal), or 06 (hex). The QL sends the code 96 when the £ key is pressed and a Translate entry 96,6 can be made to produce a printed £ for a keyed one.

Insert £

As the printed £ is a feature you are likely to want available all the time, it can be switched on right from the start, by inserting the Control Code Section or equivalent codes in the Preamble of the printer driver — ESC,"I,"1 in the case of the Taxan/Canon.

Putting a new computer next to my #1 QL immediately created a problem — the picture on the Cub display with the QL wavers. You may have lived with an unsteady screen presentation for years and accepted that it was a function of the display, not realising that it was the result of interference from another appliance. Similarly, you may not be aware that your QL and display can upset a domestic TV. The solution may not be easy but it is likely that the interference is radiated, rather than passed through the mains wiring, and

SHOOTER

E M S O L V E D

some form of metallic screening is required to stop it.

One thing worth trying is putting a sheet of aluminium cooking foil round the unit which seems to be producing the interference; another computing magazine published a letter from a reader who had installed chicken wire netting around his machine, because his landlord had complained about poor reception on his TV. Where space permits, the best approach is to put the computer as far away as possible from the TV, preferably on a different level, on the basis that most radiation will not pass downwards through a metallic chassis. Does anyone have other ideas which have worked?

Use of RAM

When you find yourself using every bit of the recently-purchased expansion memory and wishing for more, it may be time to analyse the way in which you are using RAM. Will all the programs which reside in memory be used every day, or even every hour or so? Two examples on my system are *Spellbound* and the printer driver for *Editor*, both of which I used to load at start-up time through an all-purpose boot routine. As the size of the dictionary file increased the speller used an increasing amount of RAM and the combined requirement for speller and printer driver has reached around 180K.

It suits me to use the speller retrospectively, waiting until documents are finished before checking the spelling. That increases the memory used, because the *Filebound* program is needed to feed the words to the speller — adding almost 30K in my system — but it allows the speller to be loaded only when checking is to be done and then dispensed with to free the space.

The objection to this approach is that the boot for *Spellbound* uses the *RESPR* instruction, which does not work once other programs are running; the way to circumvent it for users with *Toolkit II* extensions in an interface is to replace this instruction by *ALCHP*. If you use the Turbo compiler there is an equivalent instruction — *ALLOCATION* — in the code file for that. The speller can then be run at any time. The printer driver self-destructs after use if F5 is pressed, so can be loaded when required, then cleared; There is little point in having it loaded automatically by a switching

program unless it is to be used frequently.

When space is really becoming short, it may be necessary to look at extension files — e.g., *Toolkit* and Turbo code — to see if they can be reduced in overall size. You may be loading many extra facilities which will not be used and some of them will be duplicated; wherever possible, they can be re-configured to reduce the space taken.

Some programs remain in memory after use and have to be killed by the user. *Spellbound* is such a program; to remove it, the *Toolkit* instructions *JOBS* and *RJOB* are needed. The first brings up on the screen the list of tasks currently loaded into the QL and the second allows specific tasks on that list to be removed.

Remember to save the latest dictionary before using *RJOB*. Bear in mind that some tasks do not have a task name and will appear on the list unidentified; do not kill any of them unless you are sure you know what you are doing. The first job on the list is *SuperBasic*; giving the command *RJOB 0,0,0* will wipe out SB and make further such operations impossible.

Some recent letters have been from suppliers rather than readers and were sent to show the other side of the coin. Some of the complaints in the letters were abusive, and — to anyone with reasonable experience of using different programs on the QL — obviously unjustified. The spelling in letters in general suggests that a spelling checker program is badly needed by many writers.

Few bugs

If programs have been advertised for many months, and reviewed in *QL World*, you should know that they are unlikely to be full of bugs. The reviewer will have spotted major problems and earlier buyers will have made known their complaints; a group of guinea pigs like myself check most programs from major suppliers before they are released to the public and make suggestions for corrections and improvements. The process continues after programs are released, leading to upgrades of many programs as time passes. It may be reasonable to have one complaint, as testing could not possibly be carried-out with all possible combinations of hardware and software, but to suggest, as

users often do, that there are several faults in a popular program is being unrealistic.

One supplier indicated that the high volume of orders dealt with each day leaves too little time to answer queries from the magazine. Where a supplier is a one-man band, as is often the case, the comment is understandable but my feeling is that a supplier who does not think it worth taking a few minutes to deal with a query from a magazine may also not be too prompt in dealing with queries received direct from customers.

If customers' letters had been dealt with within a reasonable time there would have been no reason for the customers to write to *QL World*, in most cases. If suppliers feel strongly enough on this point to write to us, their letters would be welcome. It should be pointed out that almost all readers' questions and complaints are dealt with directly by letter and not published.

Long trail

I received a telephone call from **Time Designs** in the U.S. after enquiring about a book which had not been received by **K. Metcalfe**. The call was made within a short time of my letter being received and an assurance was made that the book had been despatched and a replacement would be sent if necessary. Incidentally, my air mail letter took about a month to get to the U.S. so do not be surprised if surface mail takes one to three months.

Blaming the Post Office for late arrival of goods is, in my experience, a poor excuse but recently I was quoted an example of inefficiency which shows that the PO cannot always be trusted. An envelope posted by a supplier on November 6 last year found its way back to that supplier on March 11 this year, marked *Gone Away — Return To Sender*. Apart from the four months taken to let the supplier know the customer had departed, there was a difference of four days between the date of posting and the date stamped on the envelope; when the PO quotes its performance figures it does so on the basis of the date stamped on the envelope. Further, the date of delivery is the date the item was received in the local PO, which may not be the date it was put into someone's letter box. In this case, the returning PO stamp was dated four days before the item was received.

S E C T O R

QL WORLD INDEX

The QL World Index is a complete reference to all Sinclair QL World/QL User articles compressed to fit in a standard QL.

In one second it will find any article by name, author or subject. For example; "printer" will find all references to printers from QL World or QL User. "Dillon" will find all articles by Charles Dillon. Everything worth knowing that has appeared in QL world and QL User from its launch in June 1983 to the current issue is included. An invaluable guide for anyone who has a collection of these magazines or wants to order back issues.

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SOFTWARE

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REAL TIME spelling checker for Quill or The Editor V1.17 onwards on the expanded Sinclair QL.

Spell Bound is a real time spelling checker for Quill or the Editor V1.17 onwards on the expanded QL. Spellbound checks your spelling as you type with its 30,000+ word dictionary, with no discernible reduction in the operating speed of Quill. The dictionary is fully expandable to your memory/media limits.

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Service Manual - This is the most up to date book for repairing the QL. It contains all circuit diagrams, faultfinding charts and oscilloscope displays to enable you to repair your own QL or understand how it works. This is not the cheap photocopy offered by some firms **£25.00**

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Page Designer 2 is a powerful new version of the program from the Quanta software library. Completely re-written and with a host of new facilities, it puts desktop publishing within the reach of everyone, at an affordable price. Page Designer 2 incorporates many features found on systems costing thousands of pounds. It provides full WYSIWYG, is easy to use and is supplied with a comprehensive manual. The program will run on a Thor or QL with at least 256K expansion memory and disc interface. A modular version will be made available for non-disc users.

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OVERDRIVE

GRAPHICS IN QUILL!

Overdrive is a new concept in printer drivers which allows you to include graphics in your Quill, Archive and Abacus programs and any other programmes that use the printer. Simply place the file name of a screen dump in curly brackets within the text of a letter or in a field in archive or a cell in Abacus. When Overdrive sees the file name it will include the graphic dump at that point.

Standard paragraphs can be assigned to spare keys and expanded on printout or you can simply put curly brackets at the top of your letter with the filename of a letterheading within them and when you print your letter out your logo will appear at the top. Overdrive also gives you 255 translate sequences each up to 80 characters long.

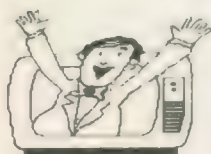
Overdrive is memory resident so does not access the microdrives at print time, unlike the Psion driver. However, Overdrive will still allow the Psion Driver to operate concurrently. Overdrive can be configured to operate on Ser1 Ser2 or both, or a separate copy can operate on each serial port independently.



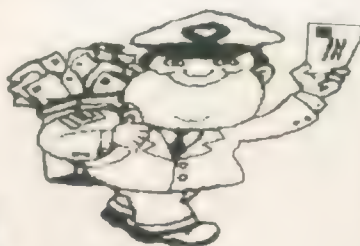
SOFTWARE

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What QL and Z88 owners have been waiting for. An on-line magazine dedicated exclusively to these machines.

Anyone can log on to the bulletin board, absolutely free of charge, from 6O'clock in the evening until 9 O'clock the following morning, all weekends and Bank Holidays.

Anyone with a modem and 1200/75 Viewdata software (including the Miracle modem) can access the board for the news, letters, reviews, problems and to order QL and Z88 products on-line.

The board will feature noticeboards for second hand equipment advice, messages etc. and last minute Sector Software bargains that didn't make the QL World copy deadline. Special offers will also be advertised

Modems to access the board are available, price £45 including software from Sector Software.

Phone 0772 454328 after 6pm and at weekends

P+R=O=G<S

If you have a program worthy of consideration, send it to 'The Progs', Sinclair QL World, Greencoat House, Francis Street, London SW1P 1DG. We pay for everything published at the usual page rates.

Program of the month

WORDSEARCH by David Watson

Wordsearch generates the popular word search puzzles and uses the screen dumper routine (gprint—prt) from Easel to print them out. For those typing in the listing, the gprint—prt routine should be copied across alongside the main program of Wordsearch. Twenty words are hidden in any direction within a grid of 20 by 20 'filler' characters.

Once the 20 words have been input, the program fits them from random squares in a random direction. It then fills the blanks with random letters. It then prints out the grid and the words to be found. Printing is slow but gives large, easy-to-read letters. The program also allows saving and loading of the lexicon, so a library can be built. An extra routine allows editing of the completed file of words.

It is best to input bigger words first to speed the process. Any spaces in the input will not be filled and thus will be spotted easily when the puzzle is filled.

```

R X W F Y R E V E D L R I X N D Z F C T  WORDSEARCH
S Q L _ W O R L D Z K F D W W Z T P D D  BY
X A G U A T W J Q K V U C G V Z N D S L  ONE
W O R D S E A R C H T Y T A Q T L N T A  WATSON
W F P Q L _ W O R L D B M Y T F R R A A  ?
C A G E U E Y B R B Z X L A L X S M C C  FOR
D G Z U K V J D D L F H A U B I R F Q A  QL-WORLD
I X O F L A K R L Y T L V R C F N F L O  THE
M G P L K K O T O N I H O F A O V B _ A  MONTHLY
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G K A C J O U M A R Q L _ W O R L D W  FOR
A M Y C O L W D L R P D Y L R X U N R L  EVERY
Z B O U Y D U _ A T E G U H T M Z G L A  QL-ENTHUSIAST
I W I O R G B C L V E M S G B P X P O A  QL_WORLD
N K Z I G S R O G Q E I W W B E U Z B H  QL_WORLD
E L V * N T W A T S O N X B H S Y X I K  QL_WORLD
D L R O W _ L Q H N J F E T L B Y V N N  QL_WORLD
R O F Q L - W O R L D X G V G P L Z T E  QL_WORLD
U J S W A G D O L _ W O R L O G O Y N E  QL_WORLD
T F D T S A I S U H T N E - L Q Q J G S  QL_WORLD
    
```

```

100 REMark --- W O R D S E A R
    C H
110 REMark      DAVE WATSON
120 DEFine PROCedure L_BIN
130 WHERE=RESPR(2000)
140 LBYTES mdv1_gprint_prt,WHE
    RE
150 END DEFine
    
```

```

160 REMark -----
170 MODE 4
180 L_BIN:Init:POKE 163976,255
190 PAPER 0:CLS0:CLS:WINDOW_9
    :WINDOW_10
200 REPEAT MAIN_LOOP
210 titl
    
```

```

220 END REPEAT MAIN_LOOP
230 REMark -----
240 DEFine PROCedure Init:Inst
    =0:ok=0
250 DIM a$(20,20):DIM v$(20,20)
    )
260 DIM S$(20,20):END DEFine
    
```

```

270 REMark
-----
280 DEFine PROCEDURE inp
290 CLS: 0: CLS: 1: WINDOW_9: WINDOW_10
300 FOR n=1 TO 20
310 v$(n)=ASK$(9," INPUT WORD
"&n$ " -",20)
320 PRINT #10 ; " "; v$(n): END F
OR n
330 END DEFine
-----
340 REMark
-----
350 DEFine PROCEDURE set_up
360 FOR n=1 TO 20
370 a$(n,1 TO)=FILL$(" ",20)
380 END FOR n
390 WINDOW_7: WINDOW_8
400 PRINT #8 ; "          HANG ON A SE
COND....."

410 btp: END DEFine
420 REMark
-----
430 DEFine PROCEDURE randsq: a=
RND(1 TO 20)
440 d=RND(1 TO 20): END DEFine
450 REMark
-----
460 DEFine PROCEDURE start
470 FOR n=1 TO 20
480 FOR m=20 TO 1 STEP -1
490 IF v$(n,m)=" ": NEXT m
500 x=m: W$=v$(n,1 TO x): direct
ion
510 PRINT #8 ; "          FITTING "; n
; " "; W$: btp
520 END FOR n: put 1
530 AKEY 0,0: END DEFine
540 REMark
-----
550 DEFine PROCEDURE direction
560 REPEAT wloop
570 randsq
580 REPEAT FITLOOP
590 ok=0: no=0: wway= RND(1 TO 8
)
600 SELECT ON wway
610   =1: IF x>21-a: no=1
620   =2: IF x>a: no=1
630   =3: IF x>21-d: no=1
640   =4: IF x>d: no=1
650   =5: IF x>21-a: no=1
660       IF x>21-d: no=1
670   =6: IF x>a: no=1
680       IF x>21-d: no=1
690   =7: IF x>21-a: no=1
700       IF x>d: no=1
710   =8: IF x>d: no=1
720       IF x>a: no=1
730 END SELECT
740 IF NOT no: EXIT FITLOOP
750 END REPEAT FITLOOP
760 aa=a: dd=d

770 FOR m=1 TO x
780 IF a$(dd,aa)=" ": ok=1: GO T
O 800

```

```

790 IF a$(dd,aa)<>W$(m): ok=0: G
O TO 820
800 mover
810 END FOR m
820 IF ok: EXIT wloop
830 END REPEAT wloop
840 :
850 aa=a: dd=d
860 FOR i=1 TO x
870 a$(dd,aa)=W$(i): mover
880 END FOR i: END DEFine
-----
890 REMark
-----
900 DEFine PROCEDURE mover
910 SELECT ON wway
920   =1: aa=aa+1
930   =2: aa=aa-1
940   =3: dd=dd+1
950   =4: dd=dd-1
960   =5: dd=dd+1: aa=aa+1
970   =6: dd=dd+1: aa=aa-1
980   =7: dd=dd-1: aa=aa+1
990   =8: dd=dd-1: aa=aa-1
1000 END SELECT : END DEFine
1010 REMark
-----
1020 DEFine FuNction ASK$(cha
n, DEMAND$, maxB)
1030 REPEAT LLOOP
1040 CLS: chan: PRINT #chan: POKF
163976,255
1050 PRINT #chan, DEMAND$: " "; : I
NPUT #chan, Q$
1060 x=LEN(Q$)
1070 IF x<=maxB
1080   IF Q$<>" " AND Q$<>" "
1090     btp: EXIT LLOOP
1100   END IF
1110   END IF
1120 PRINT #chan: " TOO LONG OR
NULL STRING"
1130 btp: PAUSE 100: btp

1140 END REPEAT LLOOP
1150 RETURN Q$: END DEFine
-----
1160 REMark
-----
1170 DEFine PROCEDURE btp: BEEP
100,100: END DEFine
-----
1180 REMark
-----
1190 DEFine PROCEDURE AKEY(cha
n, CL)
1200 IF CL: CLS: chan
1210 btp: PRINT #chan: \ " PRESS
ANY KEY TO CONTINUE"
1220 PAUSE: btp: CLS: chan: END DE
FINE
1230 REMark
-----
1240 DEFine PROCEDURE choose_f
unc
1250 k=CODE(INKEY$(-1)): SELECT
ON k
1260   =232: inp
1270   =236: set_up: start: FILL
_COPY: put (1): HARD
1280   =240: EDIM
1290   =244: put 0: HARD
1300   =248: S_L
1310   =27: STOP
1320   =REMAINDER : GO TO 1250

```

```

1330 END SELECT : END DEFine
1340 REMark
-----
1350 DEFine PROCEDURE tit1
1360 WINDOW_5: WINDOW_6: WINDOW_
7: WINDOW_8
1370 PRINT #6, \ "          W O R D S
E A R C H "
1380 PRINT #5, \ "          F1      INP
UT WORDS"
1390 PRINT #5, "          F2      SCRA
MBLE & ADD FILLERS"
1400 PRINT #5, "          F3      EDIT
WORDS"
1410 PRINT #5, "          F4      SOLU
TION"

1420 PRINT #5, "          F5      SAVE
/LOAD FILE"
1430 PRINT #8; "          ESC TO Q
UIT"
1440 choose_func
1450 END DEFine
-----
1460 REMark
-----
1470 DEFine PROCEDURE WINDOW_6
1480 OPEN #6, CON_251X30A111X3
6: PAPER #6,2
1490 INK #6,1: BORDER #6,2,6: CL
S: #6: END DEFine
1500 DEFine PROCEDURE WINDOW_5
1510 OPEN #5, CON_251X75A110X6
6: PAPER #5,3
1520 INK #5,7: BORDER #5,2,4: CL
S: #5: END DEFine
1530 DEFine PROCEDURE WINDOW_7
1540 OPEN #7, CON_251X25A110X1
41: PAPER #7,0
1550 INK #7,2: BORDER #7,2,2: CL
S: #7: END DEFine
1560 DEFine PROCEDURE WINDOW_8
1570 OPEN #8, CON_238X12A114X14
7: PAPER #8,0
1580 INK #8,2: CLS: #8: END DEFine
1590 DEFine PROCEDURE WINDOW_9
1600 OPEN #9, CON_240X204A27X1
0: PAPER #9,0
1610 INK #9,7: BORDER #9,1,2: CL
S: #9: END DEFine
1620 DEFine PROCEDURE WINDOW_1
0
1630 OPEN #10, CON_134X204A270
X10: PAPER #10,0
1640 INK #10,7: BORDER #10,1,2:
CLS: #10: END DEFine
1650 REMark
-----
1660 DEFine PROCEDURE FILL_COP
Y
1670 PRINT #0, \ "          HANG ON A
TICK"
1680 FOR n=1 TO 20
1690 S$(n,1 TO)=a$(n,1 TO)
1700 NEXT n
1710 FOR n=1 TO 20
1720 FOR m=1 TO 20
1730 XX=RND(65 TO 90)
1740 IF a$(n,m)=" ": a$(n,m)=CH
R$(XX)
1750 NEXT m: NEXT n
1760 END DEFine

```

```

1770 REMark
-----
1780 DEFine PROCedure dump
1790 CLS£0:CALL WHERE:END DEFine
-----
1800 REMark
-----
1810 DEFine PROCedure S_FIL
1820 F$=ASK$(8," NAME OF FILE?
MDV1_",10)&"_WSQ"
1830 F$="mdv1_"&F$
1840 DELETE F$:OPEN_NEW £15,F$
1850 FOR rec =1 TO 20
1860 WORDS=v$(rec):PRINT£15,WORDS$
1870 END FOR rec:CLOSE £15:END DEFine
-----
1880 REMark
-----
1890 DEFine PROCedure L_FIL
1900 NOF=0:dirrer
1910 IF NOF:RETURN
1920 OPEN_IN £15,"MDV1_"&f11$
1930 PRINT £8;" LOADING ";f11$(1 TO LEN(f11$)-4);"... "
1940 FOR rec=1 TO 20
1950 INPUT £15,WORD$:v$(rec)=WORD$
1960 END FOR rec
1970 CLOSE £15:set_up:start:FILE_COPY

```

```

1980 pout (1):HARD
1990 END DEFine
-----
2000 REMark
-----
2010 DEFine PROCedure S_L
2020 PRINT £8;" SAVE OR LOAD? <S/L><ESC>"
2030 bip
2040 REPEAT LSLOOP
2050 I$=INKEY$(-1)
2060 IF CODE(I$)=27:RETURN
2070 IF I$="S"OR I$="L":EXIT LSLOOP
2080 END REPEAT LSLOOP
2090 IF I$="L":L_FIL:RETURN
2100 S_FIL:END DEFine
-----
2110 REMark
-----

```

```

2120 DEFine PROCedure HARD
2130 PRINT £0;" HARD COPY? <Y/N>"
2140 REPEAT YNLOOP
2150 I$=INKEY$(-1)
2160 IF I$=="Y" OR I$=="N":EXIT YNLOOP
2170 END REPEAT YNLOOP
2180 IF I$=="N":CLS£0:RETURN
2190 CLS £0:dump:END DEFine
-----
2200 REMark
-----
2210 DEFine PROCedure pout(SOL)
2220 CLS:CLS£0:WINDOW_9:WINDOW_10
2230 FOR j=1 TO 20
2240 FOR k=1 TO 20
2250 IF SOL=1:PRINT £9;a$(j,k)
2260 IF NOT SOL :PRINT £9; S$(j/k):

```

```

2270 IF k<=19:PRINT £9;" ";
2280 END FOR k:PRINT £9:END FOR j
2290 FOR k=1 TO 20
2300 PRINT £10;" "; v$(k, 1 TO ):END FOR k

```

```

2310 END DEFine
-----
2320 REMark
-----
2330 DEFine PROCedure dirrer
2340 PRINT £8," ACCESSING DEVICE"
2350 n$="MDV1_dir_temp":CLS£5:num=0
2360 DELETE n$
2370 OPEN_NEW £15,n$:DIR £15,MDV1_
2380 CLOSE £15:GET_FIL
2390 IF num=0
2400 PRINT£8;" NO FILES AVAILABLE!"
2410 DELETE n$:NOF=1:RETURN
2420 END IF
2430 OPEN_IN£15,n$
2440 REPEAT FIN
2450 bip
2460 INPUT £8;" TYPE TITLE NUMBER -- ";CH$
2470 CHECKER
2480 IF CH<count AND CH>0:EXIT FIN
2490 END REPEAT FIN
2500 GET_TOT:CLOSE£15:DELETE n$

```

```

2510 f11$=W$:CLS£5:CLS£8:END DEFine
-----
2520 REMark
-----
2530 DEFine PROCedure GET_FIL
2540 OPEN_IN£15,n$:INPUT£15;W$:W$
2550 y=1:x=1:count=1
2560 REPEAT loop
2570 IF y=6 AND x=1:x=x+20:y=1
2580 IF y=6 AND x=21
2590 PRINT £8;" MORE...":PAUSE:x=1:y=1
2600 CLS£5

```

```

2610 END IF
2620 AT £5;y,x
2630 IF EOF(£15) THEN EXIT loop
2640 INPUT £15;W$:pq=LEN(W$)
2650 IF pq<5:GO TO 2630
2660 IF W$(pq-2 TO pq)<>"WSQ":GO TO 2630
2670 PRINT£5;count;" ";W$(1 TO LEN(W$) 4)
2680 count=count+1:y=y+1:num=num+1
2690 END REPEAT loop:CLOSE £15:END DEFine
-----
2700 REMark
-----

```

```

2710 DEFine PROCedure GET_TOT
2720 f=1:INPUT £15;W$:W$

```

```

2730 REPEAT loop1
2740 INPUT £15;W$:pq=LEN(W$)
2750 IF pq<5:GO TO 2740
2760 IF W$(pq-2 TO pq)<>"WSQ":GO TO 2740
2770 f=f+1:IF f-1=CH THEN EXIT loop1
2780 END REPEAT loop1:END DEFine
-----
2790 REMark
-----

```

```

2800 DEFine PROCedure CHECKER
2810 IF CH$="" :CH$="0"
2820 FOR L=1 TO LEN(CH$)
2830 IF CODE(CH$(L))<48 OR CODE(CH$(L))>57
2840 CH=0:bip:RETURN
2850 END IF
2860 END FOR L
2870 CH=CH$
2880 END DEFine
-----
2890 REMark
-----

```

```

2900 DEFine PROCedure EDIM
2910 CLS:WINDOW_9:WINDOW_10
2920 REPEAT ELOOP
2930 AT£9,8,5

```

```

2940 PRINT £9;"EDIT A WORD (Q TO QUIT)"
2950 FOR k=1 TO 20
2960 PRINT £10;" ";v$(k,1 TO):END FOR k
2970 j=0:AT £9;10,5
2980 PRINT £9;"SELECT WITH ARROW KEYS"
2990 REPEAT ARROW
3000 AT£9; j,37:PRINT£9;"="
3010 i=CODE (INKEY$(-1))
3020 bip:AT £9;j,37:PRINT£9;" "
3030 SELECT ON i
3040 =10:EXIT ARROW
3050 =32,216:j=j+1
3060 =81,113,27:EXIT ELOOP
3070 =REMAINDER : j=j-1
3080 END SELECT
3090 IF j<0:j=19
3100 IF j>19:j=0
3110 END REPEAT ARROW
3120 AT £9,12,5
3130 PRINT £9;"EDIT ";v$(j+1)
3140 AT£9,14,5:INPUT£9;" " : ;v$(j+1)
3150 XX$=FILL$( " ",32)
3160 AT £9,12,5:PRINT£9:XX$\\X X$
3170 CLS£10
3180 END REPEAT ELOOP
3190 WINDOW_9:WINDOW_10
3200 END DEFine

```

```

10 MODE 4
100 WINDOW£1,512,256,0,0:PAPER 0:CLS£1
105 WINDOW£2,512,256,0,0:PAPER £2,0:CLS£2
110 WINDOW £0,512,26,0,230: PAPER£0,0:CLS£0
120 LRUN mdv1_ws

```

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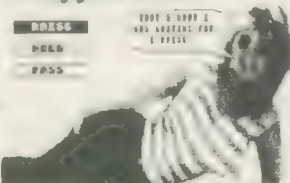
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MICRODRIVE

KEY

B = Superbasic; A+O = assembler and object code; M+B = machine code and Basic loader; A+B+O = assembler and Basic loader and object code; S = supercharged; L = QLiberated; f1 = monitor mode; f2 = TV mode

- | | |
|--|--|
| 1. DIY ASSEMBLER by Giles Todd (B) £5
A complete two-pass assembler which assembles all 68008 code and supports the directives DRG, END, EQU, DC and DS. | 35. QWHIST by John Wakelield (B) £3
You play south and the computer plays north against automatic east/west opponents. <i>QL World</i> , August 1987. |
| 2. MINI MONITOR by Richard Cross (A+O) £3
Multi-tasks on the QL using only 3K of RAM. Commands include dumping registers, memory and ASCII m/c trace, register store, memory move and store, and jumps. <i>QL User</i> , October 1985. | 36. MAIL MERGE by Stanley Sykes (B f2) £1
Handy utilities providing mail merge and labeller for Quill files, plus a demo. |
| 4. GOLF by Shergold and Tose (B f2) £2
Up to 50 courses of varying difficulty with lakes, rivers, bunkers and trees. You decide power and direction of each stroke. <i>QL User</i> , May 1985. | 37. THE DOUBLE by P. G. Ives (B f2) £4
A large football strategy game. You manage a team through four divisions, buying and selling, boosting morale through the league and F.A. Cup season. |
| 5. PALADIN by Williams and Holliday (A+O) £5
All-machine code space-invaders game used as the basis of the games programming series beginning in April 1985. | 40. ROULETTE by Santiago Rubio (B) £3
Spanish/English version of the gambling game, including Leigh Pattern system to break the bank. <i>QL World</i> , September 1987. |
| 7. PACMAN by Steve Deary (B) £1
Almost 20 screens of varying difficulty including an invisible maze. <i>QL User</i> , March 1985. | 43. QSQUIDGE by Glassbrook and Swinton (S) £2
An arcade hunt through an 8 x 8 expandable grid of rooms for the nine parts of Squidge's rocket. <i>QL world</i> , October 1987. |
| 8. FAMILY TREE by Andy Carmichael (B) £3
Archive program and database for assembling and displaying large family trees. <i>Theory of Relativity</i> , <i>QL User</i> , July/August 1985. | 44. COMPRESS by David Marsh (B) £2
Utility to compress SuperBasic files without losing the program structure. |
| 9. COMPOSER by James Lucy (L) £3
Completed in <i>QL User</i> , October 1985, this QLiberated program allows you to compose, play and edit music, including tempo, staccato, legato and sharps. | 45. SUPERBREAKOUT by R. Davidson (M+B) £2
Fast m/c version of the classic bat, ball and wall game. Optional double bats and/or balls. |
| 17. CAD QL by Tony Quinn (S) £4
The QL is particularly suited to CAD programs. This version includes rubber banding and user-definable symbols. <i>QL World</i> , September 1988. | 46. NAVIGATOR by Norman Marks (B) £2
Calculates distance and direction between longitude and latitude points on the Earth. Expandable list of locations. |
| 19. STARPORT 2001 by Karl Jeffrey (M+B) £3
Galaxian-style arcade game with fast m/c entry. <i>QL World</i> , November 1986. | 47. 3D MAZE by R. Clements (B) £2
Chase round the three dimensional maze against the clock, searching for the key to the next level. |
| 24. DESIGN 3D by J. F. Tydeman (S) £4
3D screen designs with the minimum of fuss. <i>QL World</i> , March/April 1987. | 48. YAHTZEE by Jason Price (B) £2
The popular dice-game with on-screen graphics. Easy and addictive. <i>QL World</i> , November 1987. |
| 25. STELLARIS by D. Carmona (B f1) £4
Real-time space adventure against the computer, including economic simulations, lunar landing and superb graphics. <i>QL World</i> , June 1987. | 50. BANK by Jay Lewington (B) £4
Menu-driven program to keep track of several bank accounts, including credits and debits, dated standing orders, statements and more. |
| 29. BRIDGE by Peter Etheridge (B) £4
Excellent version including accurate bidding, automatic or manual card play, replay hands, save and load and more. | 51. PERSPECTIVE by A. Diddot (B) £1
Space is big. This program aims to prove it, with a graphical guided tour of the Earth, solar system, suns, galaxies and the whole of creation. |
| 32. ADVENT2 by Phillip Sproston (B) £4
Arcade adventure with humour: rooms, robots and problems to keep you on your toes. | 52. SPACE PODS by Simon Quinn (M+B) £3
Your lone ship must protect six energy pods against the aliens. Machine code. <i>QL World</i> , December 1987. |
| 33. CLOCK by Leslie Fahidy (B f2) £3
On-screen clock to set or read the time. Education. <i>QL World</i> , June and July 1987; complete program. | 53. GRAPHIC WRITER by S. M. Walker (B) £2
A graphic design program which can save your pictures as SuperBasic commands for use in other programs. <i>QL World</i> , December 1987. |
| 34. QL CONVERSION/CALCULATOR (f2) £2
Weights and measures, conventions and reverse Polish, converts anything to anything. Menu-driven, easy to use. | 54. ZAPMAN by L. Miles (M+B) £3
Fast-action m/c version of the Pacman genre. Variable skill levels and maze formats. |
| | 55. ADVENTURE PLAYTIME by A. Pemberton (B) £3
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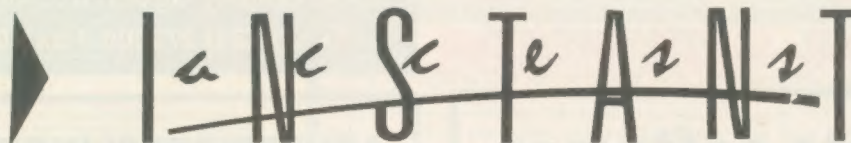
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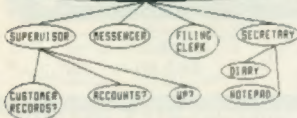
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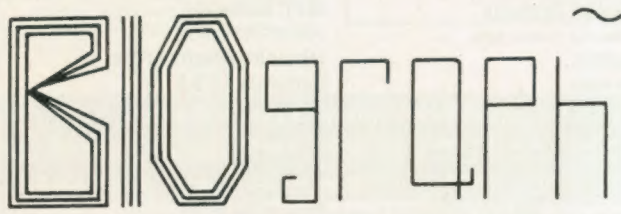
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 * NEOchrome Sampler - colour graphics program * 1st Word - Word Processor
 In addition, we at Silica would like to see you get off to a flying start with your new computer, so we have put together a special **ST STARTER KIT** worth over £100, which we are giving away **FREE OF CHARGE** with every ST computer purchased at our normal retail prices. This kit is available **ONLY FROM SILICA** and is aimed at providing users with a valuable introduction to the world of computing. We are continually upgrading the ST Starter Kit, which contains public domain and other licensed software, as well as books, magazines and accessories all relevant to ST computing. Return the coupon below for full details.

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At Silica Shop, we have a dedicated service department of seven full time Atari trained technical staff. This team is totally dedicated to servicing Atari computer products. Their accumulated knowledge, skill and experience makes them second to none in their field. You can be sure that any work carried out by them is of the highest standard. A standard of servicing which we believe you will find **ONLY FROM SILICA**. In addition to providing full servicing facilities for Atari ST computers (both in and out of warranty), our team is also able to offer memory and modulator upgrades to ST computers.

1Mb RAM UPGRADE: Our upgrade on the standard Atari 520ST-M or 520ST-FM keyboard will increase the memory from 512K to a massive 1024K. It has a full 1 year warranty and is available from Silica at an additional retail price of only £86.96 (+VAT = £100).

TV MODULATOR UPGRADE: Silica can upgrade the 1040ST-F to include a TV modulator so that you can then use it with your TV set. This is an internal upgrade and does not involve any untidy external boxes. A cable to connect your ST to any domestic TV is included in the price of the upgrade which is only £49 (inc VAT). The upgrade is also available for early 520ST computers at the same price.

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Rest assured that when you buy your ST from Silica Shop, you will be fully supported. Our free mailings give news of releases and developments. This will help to keep you up to date with new software releases as well as what's happening in the Atari market. And in addition, our sales staff are at the end of a telephone line to service all of your Atari requirements. If you purchase an ST from Silica and would like any technical advice, we have a full time technical support team to help you get the best from your computer. Because we have both the staff and the systems specifically dedicated to providing after sales service on Atari ST computers, we are confident that our users enjoy an exceptionally high level of support. This can be received **ONLY FROM SILICA**.

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